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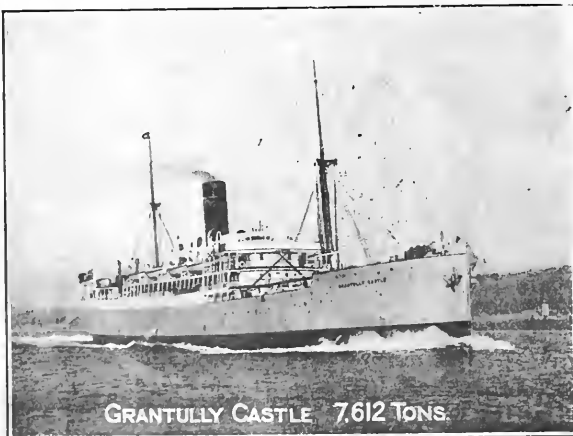
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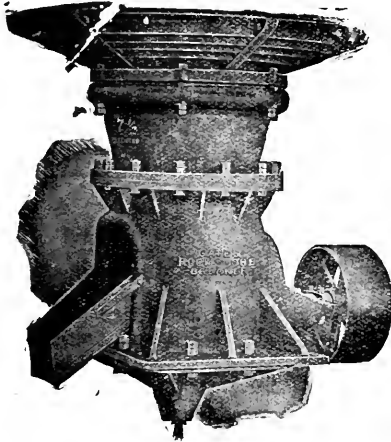
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## Notes and News.

In this issue we print a valuable article by Dr. Wagner, the well-known geologist, on the alluvial diamond diggings at Kameelfontein in the Pretoria district. The article is illustrated by two typical views of the diggings; and is the first authoritative account of the scene of the latest "rush" that has appeared. Apart from its popular interest, the article derives high scientific value from the standing of its author, whose classic work, "The Diamond Mines of South Africa," invests him with particular authority in that field.

\* \* \* \*

The enterprising character of Rhodesian mining is well illustrated by the statistics relating to asbestos that appear periodically in the Report of the Executive Committee of the Rhodesian Chamber of Mines. During May, for instance, the production of asbestos in Rhodesia from some ten concerns in the Bulawayo, Gwelo, and Victoria districts respectively, amounted to 5514 tons, valued at £8,792. During the same period there were produced 196,288 tons in the Transvaal and the district of Hay, Cape Province, valued at £3,180, the Transvaal output amounting to 10 tons. The average price of the Union product, it will be seen, was about £18 per ton, the Transvaal asbestos being valued at the extraordinary high figure of £50 per ton, and that from the Griquatown country at a little over £16 per ton. The asbestos from Rhodesia is valued at a little less than £16. The extraordinary thing about all this is the great apathy which appears to prevail with regard to deposits in the Union, whence mineral can be obtained in fairly large quantities and sold for the prices quoted. The industry has been established in the Hay district, some distance beyond Griquatown, for many years, and is largely monopolised by the De Beers interest; but independent workers earn a good sum by selling the material, which requires little plant and initial capital, to the principal company.

\* \* \* \*

The convenience of being able to make reliable tests of oil shale in the field has already been referred to in this journal, with special reference to an apparatus for distillation purposes, that was brought from England by Mr. Blair, and put together in what was little better than an outhouse on the farm Zetfontein, near the Natal border. The original cost of the plant in England was about £175, and comprised a petrol engine for generating and supplying gas for heating and lighting purposes; together with retorts, condensers, collectors, etc. The retorts, carefully protected by asbestos-lined shields, and capable of containing a fairly large charge of shale, were heated by a battery of gas burners, which were easily able to provide all the heat required. Steam, generated by gas at another part of the apparatus, was introduced, after being superheated beneath the shield of the retort, to one end of the latter, and in addition to carrying and distributing a certain amount of heat to the shale, maintained a suitable atmosphere for the distillation. It has been found that the use of steam superheated is important, inasmuch as it tends to drive out oxygen that may be present, either sequestered or absorbed by the coal and as yet not chemically combined. An atmosphere free from oxygen is obviously of the first importance. The distillate coming over from the retort is then passed through a condenser in the usual way and thence to a collector, where practically all the volatile matter of importance is retained, the lighter gases being allowed to escape into the air. With the apparatus a large and constant supply of samples has been dealt with accurately and comparatively rapidly. By this means it has been possible to direct working operations from day to day, a process that would not have been possible if it had been necessary to forward the samples, say, to Johannesburg. An important deduction that was made at an early stage of the proceedings was the ratio of gallons of

crude oil per metric ton to percentage of volatile matter. It has been shown on distillation that the ratio varies considerably according to the quality of the shale mined. That shale which is richer is therefore giving a higher ratio of gallons to volatile percentage than that which is poorer. The difference in certain shale beds with regard to the oil content from one point to another has also been definitely established. This is a matter that was anticipated, of course; but the degree in which this variation took place was naturally the essential point to be investigated, and the tests made have thrown some useful light upon the question.

\* \* \* \*

The report of the Village Main Reef for 1915 states that the year's operations realised a net profit of **Village Main Reef.** £110,796 and £243,820 was brought in, making £354,616. This sum has been dealt with as follows: Dividend No. 29, declared June 11, 1915, £94,400; depreciation written off, £11,605—£109,005; carrying forward £245,611. The directors regret that, owing to the movements of ground, hereinafter referred to, and the difficulty of foreseeing to what profits might be affected thereby, they did not feel justified in declaring a final dividend for last year. They now recommend the payment of an interim dividend of 2s. per share, free of tax, to shareholders registered on June 30 and to holders of Coupon No. 29. At the end of September a movement of strata took place with somewhat serious results. The repairs rendered necessary by the occurrence occupied three months, and involved a loss of £30,000 on the working operations, apart from the loss of profit on the ore crushed during that period. Operations at the mine are now being conducted under more normal conditions, but the consulting engineer finds it unsafe to predict continuous mining up to the full capacity of the reduction works. The revaluation of the ore reserves shows that at December 31 last the total was 635,050 tons of a value of 7.1 dwt.

\* \* \* \*

The directors of the General Mining and Finance Corporation, Ltd., are to be congratulated on being able to show in their report—to be presented at the postponed annual meeting on **The General Mining Annual Report.** July 27—improved results for 1915. The delays and difficulties caused by the war have further postponed indefinitely the prospect of a resumption of dividends. The last distribution was 1s. 6d. per share for 1910. However, it is so far encouraging that this time a profit is recorded, even if it is only £15,100, as against a loss of £2,200 for 1911 and one of nearly £50,000 for 1913. There was a small increase in revenue last year, due to the New Goch having re-entered the dividend-paying list and the Meyer and Charlton having made a larger distribution of profits. The debit balance at profit and loss account has been reduced to £30,500, against £15,600 brought in. The book value of the corporation's share and Debenture holdings in other concerns has grown slightly to £1,795,000, but as the result of war conditions on the Stock Exchange the depreciation in their market value has also increased a little and at end-December was no less than £983,800. With the recent rise in the shares of several of the corporation's subsidiaries—notably Roopeport Uniteds, the position has doubtless been relieved. In any case, as the directors again emphasise, the depreciation "do not represent a realised loss," although "any material improvement depends largely upon the refinancing of such of the companies under the corporation's control as require additional working capital for the resumption of their normal and continued prosecution of mining operations." When peace comes, if not before, schemes of this nature will doubtless be readily arranged in connection with the Cinderella Consolidated and Rand Collieries' properties, which are at present dormant. An interesting departure is the acquisition of an option to provide working capital for the Rand Rietfontein Estates, Ltd., which is testing a property lying immediately east of the Daggfontein.

The directors have declared a 10 months' dividend at the rate of 6 per cent. per annum, less income tax, on the Preference shares, thereby making the cumulative dividend paid up to the 31st December, 1915. The dividend will be paid on June 20th, 1916, to all Preference shareholders to whom the company is not prohibited by law from paying dividends registered on the books of the company at the 13th June, 1916.

\* \* \* \*

The report for the three months ended March 31st, 1916, shows a profit of £172,686, equal to **Randfontein Central G.M.** 6s. 1-90d. per ton of ore milled. The expenditure on capital account (appropriated from profits) amounted to £88,013. The payable ore reserves were 4,606,781 tons, at 7.4 dwts., and 3,300,549 tons at 4.6 dwts., which is unpayable at the present limit of working costs.

\* \* \* \*

The sixty-fourth annual meeting of the members of the Institution of Mining Engineers took place in mail week. Sir William Garforth (the temporary President), in opening the meeting, stated that the Council had unanimously nominated Mr. Wallace Thorneycroft as President for the next year, and had awarded the Institution medal to Sir William Atkinson, Divisional Inspector of Mines. At the request of the Advisory Council for Research the Institution had appointed a committee, which had undertaken the investigation of upwards of thirty different inquiries connected with coal mining operations on the surface and underground. It could be shown, he said, that the general practice of British coal mining was quite equal, if not superior, to that of other nations. He expressed the opinion that the steam plants at many of the collieries in this country were very wasteful, and said that the most important part of the investigation was to inquire into the national loss which was being entailed by the neglect to recover more of the valuable substances of which coal was composed. Though the distillates of coal were essential to many industries, only about 20 per cent. of the output of this country was at present carbonised, and the whole of the tar, ammonia and benzol contained in the remaining 80 per cent. was, therefore, lost. The time had now arrived when coal should no longer be regarded simply as a fuel. Of the quantity carbonised 5,000,000 tons a year were being burned in "bee-hive" ovens without obtaining the recovery of by-products. This quantity alone represented a loss to the nation of 70,000 tons of ammonium sulphate, 250,000 tons of tar, and 12,000,000 to 15,000,000 gallons of benzol, all of which could be saved if the coal were distilled in retort ovens. With regard to the distillation of coal, inquiries should be made into the possibility of utilising the waste gas from by-product ovens, as there were at the present time 7,000,000 cubic feet of waste gas available as fuel, of which only a small proportion was used.

\* \* \* \*

The President of the Institution of Mining Engineers has been advised by the Secretary of the War Office that the Army Council are desirous of obtaining the services of mining engineers for employment with the **Tunnelling Commissions.** Tunnelling Companies of Royal Engineers. Preference will be given to candidates between the ages of 25 and 35 years, and those found suitable will be appointed to temporary commissions and be required to proceed overseas at an early date. Mining engineers not members of the Institution, but possessing the necessary qualifications, are also eligible. Intending candidates for commissions, or those at present serving in the ranks who desire to be transferred to the Royal Engineers, are requested to communicate at once with the Secretary of their own Institute, who will supply a form of application. Only candidates who have already attested are eligible.

Mr. Ryan, the Premier of Queensland, is now in London.

#### State "Abattoirs" and Stock-Raising.

Speaking at Brisbane before leaving for London, Mr. Ryan referred to his Government's policy as follows:— "The Government had established a State butcher's shop. It was impossible to go any further in such an enterprise without they had the means of obtaining the meat without the price being forced up to an exorbitant rate. It was the intention of the Government to establish other State butcheries at Rockhampton, Townsville, etc. It was not possible to deal with the price of meat unless they got down to bedrock and had cattle runs of their own. The Cabinet had decided to establish cattle runs. An area of 300 square miles had fallen in. It would not be put up for selection, but would remain Crown lands and it would be the first cattle station the Government had. The Government intended to stock that run, and would go on with that policy until it was able to see that the people got meat at a reasonable price. The country had been going on for decades past with the policy of drift, and now they had meat at a high price. The Government hoped to be able to cope with the Beef Trust and other influences that sent up the price of meat to the public."

\* \* \* \*

Referring last week to the resolutions of the Economic Conference, Mr. R. Niven, President of the Chamber of Commerce, said they were so far-reaching, and embodied principles so revolutionary in character, that he would be a bold man who would attempt to express judgment upon them without careful study; but while they contained drastic reforms, some of which were without precedent, yet the evils they were designed to meet and overcome were likewise without precedent. They were face to face with conditions never before experienced, and such conditions required new methods. It had long been believed that Germany would, after the war, make strenuous efforts to recapture her lost trade, but few of them realised that her preparations to this end were on such a scale as was indicated in the official report. Without going into the resolutions that day, he would only say that it must be gratifying to members to notice in how many points the resolutions upon this important subject which that Chamber passed a few months ago agreed with those of the Paris Conference.

\* \* \* \*

According to the London papers, the latest munition favourite share is Fraser & Chalmers.

#### The Rise in Fraser & Chalmers.

This company, in normal times, is chiefly concerned with the supply of mining machinery to South Africa. The company has experienced a good many ups and downs, and the annual dividend on the Ordinary shares gradually came down from 10 per cent. to 3 per cent. for the year ended June 30, 1912, since when only the Preference dividend has been forthcoming. The position, however, has since substantially improved, while War orders have come to give the concern a fresh leg-up. As a consequence, the company is doing much better now, and the £3 shares, which at one time last year could have been picked up at about 13s., have now more than doubled in value. The market considers that the liquid assets and freehold property alone justify the present quotation; but, as regards dividend prospects, that must depend upon what proportion of the profits the directors may feel justified in distributing.

\* \* \* \*

In the annual report of the Real Estate Corporation of South Africa for the financial year to the end

#### Real Estate of South Africa.

of March 31, it is stated that the revenue was £25,571, but increased expenses and taxation reduced the net profit to £9,058. This compares with £13,221 for 1911-15. The dividend is again to be 6 per cent., as against 10 per cent. for each of the three years to March 31, 1911; but the allocation for depreciation of buildings is to be reduced from £2,500 to £1,500, and the carry-forward from £18,103 to £17,211. In existing circumstances the results are quite satisfactory as could have been reasonably expected.

## TOPICS OF THE WEEK.

### SCIENCE AND INDUSTRY.

ONE of the resolutions adopted at the Madrid Economic Conference at Paris recommended that the Allies should take the necessary steps "without delay" to render themselves independent of enemy supplies in so far as regards the material and manufactured articles "essential to the normal development of their economic activities." One method suggested by the Conference was "the grant by the State of financial assistance for the encouragement of scientific and technical research, and the development of new and industrial resources." It is noteworthy that the passage quoted represents substantially the policy towards which Australia has already made an important advance. Mr. Hughes, the Australian Premier, according to the Australian correspondent of the "Reichs-Tageblatt," has learned the lesson of British neglect of science and its application to industry, and is convinced that we must, without delay, direct the best intelligence amongst us to that we can produce more without raising our productive power." Last December he declared the Government's intention of creating a Ministry of Science and Industry. An Inter-State Committee was appointed to formulate proposals on these lines, and it has recommended that such an Institute should be established by Act of Parliament, and that its functions should include the promotion of scientific research in relation to industry, the collection and dissemination of industrial scientific information, the establishment and control of National Laboratories and of industrial research fellowships, and the coordination by grants of scientific investigation wherever carried out. "The Institute," according to the same correspondent, "is to be controlled by three highly-qualified salaried directors who are to be members of, and receive advice from, an Advisory Council consisting of representatives representing science, and the principal primary and scientific industries." One of the directors is to be a business man and an organiser, and the other two are to be selected specially for their scientific attainments, and general experience. It is a striking fact that the idea underlying the Australian Institute has apparently occurred simultaneously, or at least independently, to others. Besides Mr. Hughes, the "Cape Times," in an excellent leader on the subject, drew attention to the fact that Canada has already begun to move in a similar direction. The recent Economic Conference held in England, at which the delegates were present from all parts of the Empire, adopted a resolution very much of the same lines, and our readers are familiar with the movement initiated by the Scientific and Technical Society of the Rand. Since that meeting we have had Professor Crawford's address as President of the Science Association, pointing out the valuable opportunities which were offered themselves in the South African Universities for bringing research work and scientific training into a definite relation with the requirements of the country. Professor Williams, in the paper printed in our columns, drives home the same lesson. Furthermore, the annual report of the General Manager of Railways has emphasised the necessity of systematic and scientific co-operation in the development of our national assets. As the "Cape Times" remarks: "All these facts point to the independence of action in South Africa, and accordingly corresponding to Mr. Hughes' plan of a National Institute on the lines of the Inter-State Committee's report. There is already a certain amount of work upon this field. The Economic Commission, and more particularly the Dominions Royal Commission, have collected a mass of evidence on the national resources of South Africa in relation to the Empire as a whole, but the report in the conditions now prevailing is in danger of being temporarily pigeon-holed. There is therefore much to be said for a central institution of a permanent character which will co-ordinate the activities of the various scientific bodies in South Africa, systematise industrial research, and by maintaining close touch with the Universities serve as a centre of distribution in all matters relating to the scientific development of industrial and agricultural resources."

## THE SOURCE OF THE WITWATERSRAND CONGLOMERATES.

IN spite of the fact that Dr. Mellor's latest contribution to the geological history of the Main Reef group of conglomerates, and particularly of that section of it which is known as the Main Reef Leader, is of a fairly detailed kind, it is becoming obvious that something more is required of him if the discussion of the subject is to be as thorough as it ought to be. No one has stated definitely what the nature of this additional information is, although in two instances that come to mind at the moment there has been a sort of tentative indication, or a kind of pointing, in the direction whence further data may be looked for. Professor Young, for example, has objected to the deltaic river theory and has gone so far as to refer to the possibilities of deposition along the shores of a wide estuary. The difficulties in the way of the deltaic theory, as he sees them, are hinted at rather than expressed in such a way that they may be used as the ground-work of an alternative theory, and he concludes by saying: "The various points that I have referred to above as difficulties that have suggested themselves to me when reading over Dr. Mellor's paper, might be elaborated at greater length, but, perhaps, I have explained them sufficiently to enable Dr. Mellor to deal with them." One can understand Professor Young's reluctance to elaborate upon the purely tectonic side of a subject which has hitherto been studied by him mainly in its microscopic aspects. His work in this field is recognised to be *sui generis*, and his conclusions are undoubtedly of considerable force and value. At the same time it is to be regretted that he has not enlarged upon the objections that have been referred to. On the other hand there is Mr. David Draper. He has not "specialised," as far as we are aware, in the investigation of any particular phenomena associated with the Witwatersrand system—unless it be stratigraphy—but has considered it in every one of its many aspects. He also objects to the deltaic theory, and insists that there is "no evidence to warrant the isolation of the Johannesburg area from the system in general"; meaning by this, apparently, the selection of the Main Reef group, and especially the Main Reef Leader, as something that requires special explanation. He says, *inter alia*: "The remarkable persistence of some members of the Witwatersrand series, together with the abrupt changes from fine-grained or argillaceous rocks to coarse sandstones, as in the case of the 'Ripple-marked Beds,' and to felspathic rocks, as in the case of the 'Felspar Beds,' must be attributed to other than deltaic action." These abrupt changes, as he points out, are especially noticeable in the Government and Promise Series, which are at a considerable distance from each other in the stratigraphic scale, and at a still greater distance from the Main Reef zone. Obviously the Witwatersrand system should be dealt with as a whole if even the Main Reef portion of it is to be satisfactorily accounted for. All these objections are useful and necessary, in the circumstances, but what we want to know is how much positive evidence can be got together for some other theory than that of deltaic deposition. In a word, some constructive criticism is wanted. There is the suggestion that estuarine or coast-line conditions may be quoted as being sufficient to explain the presence and character of many of the beds of the Witwatersrand system. If this be so why does not someone come forward with a definite theory based on these conditions? The reason very probably is that on reflection the estuarine and shore line idea is quite unable to meet the case of the whole succession of beds from the Hospital Hill quartzites to the Elsberg horizon, and although Mr. Draper avoids giving us any inkling as to what he thinks about the matter, his view that the system cannot properly be treated in sections is a sound one. As a matter of fact, the deltaic theory seems to meet the whole case excellently, as far as it goes. The difficulty is that it does not go far enough. There is something behind it, as there is behind the objections of those who do not agree with Dr. Mellor. The wonderful succession of sands, muds, and pebbles, and the remarkable way in which they are related, can only be accounted for by accepting a preliminary step in the shape of intermittent glacial action over a long period of time. There is no positive evidence of any action of this kind, perhaps, as there is in the case of the Glacial Period of Post-Tertiary

times; that is scarcely to be expected. There is what may be called circumstantial evidence of it on every side, however, and there is no reason to hesitate about saying so. At any rate we are getting nearer to the bed-rock of things by discussing it, and that is what is necessary if Dr. Mellor's conclusions are to be adequately dealt with.

## THE CENTRAL MINING REPORT.

ALTHOUGH the annual report of the Central Mining and Investment Corporation is primarily of interest in Europe, where the majority of the shareholders reside, it is not without interest for people on this side of the water. The latest annual report, for instance, reflects the Crown Mines and East Rand Proprietary disappointments, and the fact that the diamond industry, in which, one way and another, the Central Mining is interested, has been almost at a standstill. A proper comparison of the income account with that of the preceding twelve months cannot be made because the items are not presented in identical form. The main items of the revenue account and the balance-sheet for the past three years are as follows:

	1915. £	1914. £	1913. £
Dividends, balance of interest, exchange and commission, and sundry credits .. ..	316,395		409,026
Balance of realised profits and losses less amounts written off .. ..	59,985	339,808	64,210
Net Profit .. ..	325,028	290,798	417,393
Dividends paid .. ..	nil.	127,500	nil.
Do. p.e. .. ..	nil.	21	nil
Share interests .. ..	4,138,117	4,431,088	4,654,836
Gift-edged stocks .. ..	2,826,034		
Mining debts .. ..	117,267	1,145,352	1,533,362
Enemy investments .. ..	560,745	540,058	(?)
Debtors, less reserves .. ..	47,270	61,788	102,926
Loans .. ..	681,544	1,460,150	557,931
Bills receivable .. ..	nil.	34,945	588,262
Cash .. ..	*351,716	*551,990	1,165,688
Depreciation written off .. ..	308,097	603,074	555,275
Depreciation reserve acc. .. ..	nil.	nil.	500,000
Creditors .. ..	3,607,600	3,108,732	2,987,688
Carried forward .. ..	24,470	24,539	24,315
Liabilities for uncalled amounts .. ..	238,470	257,137	576,554

\*Of which £177,346 is in Germany.

As regards the income, the dividends received were inferior in amount to the 1914 items; on the other hand, while certain of the investments were sold below cost price, the revival in Johannesburg towards the end of last year enabled the loss to be wiped out by other sales and a profit to be realised. Being so largely interested in South African undertakings, the depreciation suffered year after year is a reflection of the general condition of the South African market, and, of course, the Central Mining is not alone in its experience. Originally the capital was £6,000,000, in £20 shares; in 1908 the nominal capital was written down to £12 and £1,200,000 of 1½ per cent. debentures were issued. The debentures were redeemed in 1910, and in the following year the capital was raised to the present amount. Following upon the remarks of Sir Lionel Phillips at the last annual meeting, the capital is to be again written down, in order to permit of the distribution of profits. It is officially pointed out that the present quotation of 6½ is far below intrinsic value. In the suggested arrangement the nominal capital is to be reduced from £12 to £8, and adequate provision is to be made for the redemption of wasting assets. The adoption of this scheme affords the opportunity to "resume forthwith the payment of regular dividends." The corporation has enlarged its interests in the Far-Eastern Rand by the purchase of blocks of Geduld and Modderfontein Deep, by the acquisition conjointly with the Rand Mines of 862 claims on Vogelstruisbult, immediately south of Daggafontein, and by a substantial participation in the Daggafontein Mines. The holding in Booyseus has been converted into a marketable security in the shape of Robinson Deep "B" shares. The diamond business is yielding a fair profit. Nothing can be done with the Magadi Soda enterprise in consequence of the East African campaign. Mr. Hugh F. Marriott, the corporation's consulting engineer, writes his usual valuable report upon the position of the principal investments.

## THE KAMEELFONTEIN DIAMOND DIGGINGS.

Full and Authoritative Description—Geological Features—Origin of the Diamonds—  
Diggers' Prospects—Future of the Diggings.

By P. A. WAGNER.

THE Kameelfontein diggings are situated some sixteen miles north-east of Pretoria,\* and immediately east of a prominent bush-clad eminence known as Kameelkop, in the valley of the unnamed tributary of the Pienaar's River, that drains the depression among the felsite hills on the farm Elandsfontein No. 85, in which the Premier Mine lies. A good deal of work has been done at different times on the diamondiferous alluvium found at intervals along the course of this stream, and Kameelfontein itself has on several occasions been the scene of fairly extensive digging operations. Three types of alluvial deposit occur on the farm. These are:—

- (1) Thin washes of diamond-bearing gravel in the present stream bed.
- (2) Elongated patches or "runs" of gravel occupying former channels of the stream and situated in close proximity to its present bed.
- (3) Ancient high-level gravels covering terraces situated at some distance from and at elevations of up to 120 feet above the stream.

In the present instance work is being practically confined to an ancient terrace, lying to the north of the river, on which, as a result, it is said of promising finds, the owner of this

to the west of the fenced area, and it is said that the gravel to the north of the diggings will also shortly be offered on lease. For the guidance of prospective diggers it may be pointed out that the gravel exposed on the new claims, west of the fenced area, does not look very promising, while that to the north of the diggings is almost everywhere covered by a considerable depth of barren over-burden, in addition to which disadvantage the gravel appears to become poorer in this direction. It is very doubtful, therefore, whether either of these areas will yield anything like such good results as the fenced-in ground.

### GEOLOGICAL FEATURES OF THE DEPOSITS

The terrace, on which the diggings are situated, has along its inner margin, some 120 yards to the north of the river, an elevation of about 40 feet above stream level. From here it rises steadily towards the north, and at the northern boundary fence, some 600 yards from the river, its elevation must be quite 100 feet. It consists of a sloping platform of Waterberg sandstone and conglomerate on which reposes a layer of coarse river wash of very variable thickness, which in turn is overlain, as a rule, by fine ferruginous gravel and red-brown surface soil. The Waterberg rocks



KAMEELFONTEIN DIAMOND DIGGINGS: A TYPICAL VIEW.

portion of the farm, a certain Prinsloo, some time ago fenced off an area of about 40 acres (roughly 600 x 400 yards). This has been sub-divided into claims, measuring 45 x 45 feet, which are leased to diggers at the rate of £2 per month. The digger has, in addition, to take out from the Mines Department a monthly prospecting licence, costing 2s. 6d., as owing to the fact that the farm has not been proclaimed, the diggers on Kameelfontein have, in the eyes of the law, the status of prospectors. Water is delivered on the claims at a cost of 61. per large barrel, and a charge of 1s. per head is made for fire wood. Diggers who have cattle or horses with them have, moreover, to pay a small fee for grazing. All the claims within the fenced area have been taken up and some 250 white diggers—the usual cosmopolitan crowd, with a small sprinkling of women—employing over 300 natives, are at present at work. Encouraged by his success the owner has recently thrown open another block of claims

strike from north-east to south-west and dip at a fairly steep angle to the north-west. The bevelled surface of the beds of sandstone and conglomerate, on which the coarse gravel rests, is very uneven and hummocky, with numerous deep pot-holes and gullies. In addition the outcrops of the harder beds of sandstone clearly acted as very efficient riffles, and the conditions on this particular terrace appear altogether to have been very favourable for the lodgment of any heavy particles carried down by the stream. It is scarcely to be wondered at, therefore, that a concentration of diamonds should have taken place upon it. The coarse river wash from which the bulk of the diamonds are recovered forms a persistent layer varying in thickness from a few inches to over 15 feet in some of the deeper pot-holes and gullies. The average thickness for the whole fenced area is probably between two and three feet. It is composed of large boulders of sandstone and quartzite, for the most part very well rounded, and smaller pebbles of sandstone, shale and white

\* The distance by road is exactly 21.6 miles.



quartz set in a clayey or lateritic matrix of reddish brown colour. The larger boulders appear to have been derived mainly from the disintegration of the underlying conglomerate, and we are thus clearly dealing with a mixture of eluvial and alluvial material. In the concentrate obtained on washing the sifted gravel there were noted small fragments of ferruginous shale, banded ironstone, non-magnetic iron-ore and very occasional rolled grains of ilmenite. There is nothing in the nature of the wash to indicate the proximity of a Kimberlite pipe. The coarse gravel, as already stated, is, as a rule, overlain by a bed of fine ferruginous gravel known locally as the "Kaffircorn Layer." This has also been found to carry diamonds in places, but the results obtained from its exploitation have, on the whole, been disappointing. The "Kaffircorn Layer" is in turn generally succeeded by red surface soil. The following sections will give a good idea of the succession in different portions of the fenced area:—

- I.—No soil; gravel, 6 in.; Waterberg sandstone.
- II.—Soil, 2 ft.; "Kaffircorn Layer," 1 ft.; coarse gravel, 5 ft.; Waterberg conglomerate.
- III.—Soil, 8 in.; "Kaffircorn Layer," 6 in.; coarse gravel, 4 ft.; Waterberg conglomerate.
- IV.—Soil, 4 ft. 6 in.; "Kaffircorn Layer," 3 ft.; red loam, 2 ft.; coarse gravel, 1 ft. 6 in.; bedrock not exposed.

the diamonds are characterised by possessing a more or less pronounced brown or yellow tint, and several pale green stones were also noted. Many of the diamonds exhibit the peculiar opalescence so characteristic of Premier Mine diamonds, and as regards crystallisation, colour and purity, etc., all the stones which the writer saw could be exactly matched in the Premier parcels. In his opinion there can be no doubt, therefore, that the Kameelfontein diamonds, for the most part at any rate, have been derived from the denudation of the Premier pipe.† Other primary deposits may, of course, have contributed, but, as already pointed out, there is nothing to indicate the proximity of a Kimberlite occurrence.

#### THE PROSPECTS OF THE DIGGER.

There appeared recently in a Pretoria paper a statement to the effect that at Kameelfontein not a single wash has proved a blank. This is a gross exaggeration of the facts. Not only have a number of washes, but several whole claims in the north-eastern portion of the diggings yielded blanks. It must, however, be admitted that the distribution of the diamonds in the Kameelfontein gravels is far more uniform than is generally the case in alluvial ground. As against this the diamonds are, as we have seen, small and of inferior quality. Taking everything into consideration, the odds against even a lucky digger earning anything but a moderate competency appear to be very great. An experienced Vaal



KAMEELFONTEIN DIGGINGS: ANOTHER VIEW.

- I.—Section exposed near the southern margin of the terrace.
  - II. and III.—Sections exposed in the central portion of the fenced area.
  - III. Section exposed near the northern boundary fence.
- The over-burden appears to increase steadily in thickness towards the north, except in the north-eastern corner of the fenced area where coarse gravel crops out at the surface.

#### THE DIAMONDS AND THEIR ORIGIN.

The average weight of the diamonds found on the Kameelfontein diggings during June was .83 carat, and the average value £3 6s. 9d. per carat. The largest diamond recovered weighed 37 carats and was valued at £300. The best stone hitherto found weighed 12½ carats and was worth £316. Recently some fine 7 and 9 carat stones have been obtained. The diamonds are, on the whole, of poor quality. Well-formed crystals are comparatively rare, and broken stones ("blocks") and cleavage fragments preponderate. Heart-shaped twin crystals are occasionally met with. While some fine white and blue-white stones are found the majority of

River digger was overheard to remark: "This place is all right, but there is no money to be made in it." That exactly sums up the position.

#### THE FUTURE OF THE DIGGINGS.

During the month of June the Kameelfontein diggings yielded 355½ carats of diamonds,‡ valued at £1,186 9s. 6d. The output for the current month should be very much larger as there are many more diggers at work. It is probable, however, that during this period the zenith of the productive activity of the field will be reached, and six months, at the outside, will see the exhaustion of practically all the claims within the fenced area.

† It may be argued against this view that the average value of the Kameelfontein diamonds is much greater than that of the Premier goods, but it must be remembered in this connection that the diamonds found in the yellow ground of the Premier Mine were very much better than those from the blue ground, and also that at the Mine a much larger proportion of very small stones is recovered than at Kameelfontein.

‡ This total includes one stone from one of the adjoining farms.

**SOUTH AFRICAN INSTITUTION OF ENGINEERS: ROLL OF HONOUR.****List of Members on Active Service and on Munition Work.**

The following list of members on active service and engaged in munition and War Office work had been compiled by the South African Institution of Engineers. The information received had been very meagre, so that the list is by no means complete:—

- H. M. Bellamy (member), Captain, British Expeditionary Force.  
 R. Blane (member), in charge of Munition Factory, Watford.  
 W. V. Blinkhorn (associate member), Driver, Mechanical Transport, B.E.A.  
 A. W. Brown (absentee member), Lieutenant, 2nd Manchester Regiment.  
 H. L. Carpenter (associate member), Sapper, Water Service Corps, B.E.A.  
 C. J. Chaplin (associate member), left to join Royal Engineers.  
 F. H. P. Creswell (member), Major, B.E.A.  
 W. Cullen (member), under Ministry of Munitions.  
 J. Driunan, in charge of Munition Work, Sheffield.  
 W. E. John (member), Lieutenant, Aviation Corps.  
 David Gilmour (hon. life member), under Ministry of Munitions.  
 G. J. Ibler (student), Corporal, 2nd S.A. Horse, B.E.A.  
 F. Flowers (member), Lieutenant, 1st Pioneers.  
 T. S. Kennedy (associate member), Captain, Royal Engineers.  
 H. Martin (member), Inspector under Ministry of Munitions.  
 C. E. Mason (member), Captain, Royal Engineers, attached Water Supply Corps, B.E.A.  
 E. G. McKeown (member), Engine Room Artificer, Royal Navy.  
 T. J. Pascoe, Munition Work.  
 C. S. Pillans (associate member), Army Service Corps Mechanical Transport.  
 Percy Perrow (student), Lieutenant, X-Ray Section, S.A.M.C., B.E.A.  
 Harry Rhodes (member), Major, 3rd York and Lancaster Regiment.  
 H. V. Symmes (member), Captain, 2nd Regiment, S.A. Infantry.  
 \*U. P. Swinburne (associate member), Major, 8th Service Battalion, Seaforth Highlanders.  
 H. L. Templer (member), Mechanical Transport, B.E.A.  
 C. G. Trevett (member), Mechanical Transport, Flanders.  
 I. H. Wilson (member), Lieutenant, 8th Machine Gun Section, S.A. Infantry, B.E.A.  
 P. Woodside (associate member), on munitions work at Glasgow.  
 R. A. Alston (member), munitions work.  
 W. Calder (past president), left for Home to join the Forces.  
 A. E. H. Dinham Peren (associate member), left for Home to join the Forces.  
 M. I. Williams Ellis (absentee member).  
 F. Elliott (associate member).  
 G. F. L. Ferguson (associate member), B.E.A.  
 G. C. Fox (member).  
 T. P. Fox (student member).  
 G. Hudson (member), left for Home to join the Forces.  
 G. F. Hutchinson (associate member).  
 J. A. Lea (associate member), left for Home to join the Forces.

H. V. McKechnie (associate member), left for Home to join Flying Corps.

B. C. Myers (associate member).

P. A. Marsburg (associate member).

R. C. Nicolaus (absentee member), Major (regiment unknown).

R. A. Newberry (associate member).

F. C. J. Nurcombe (student member).

F. A. Ovendale (member), S.A.S.C.

W. A. Pitts (associate member), left for Home to join the Forces.

W. Thomson, B.E.A.

W. H. Wood (past president).

(N.B.—The second part of the list is incomplete, and members who have any information concerning any of the names appearing in it are requested to communicate with the secretary.)

\*Major U. P. Swinburne was severely wounded in the attack on Loos. He is making a good recovery.

**Transvaal Gold Mining Estates.**

The following are the particulars of the Transvaal Gold Mining Estates, Ltd., output for the month of June, 1916:—  
 Cental Mines: Tons crushed, 12,750; yielding, 6,409,872 fine ozs. Elandsdrift Mine: Tons crushed, 1,460; yielding, 1,061,761 fine ozs. Vaalhoek Mine: Tons crushed, 1,680; yielding, 618,761 fine ozs. Estimated value of month's output, £33,587; estimated profit for the month, £11,079.



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## THE GEOLOGICAL SURVEY OF SOUTHERN RHODESIA.—II

### Detailed Report of the Director for the Year 1915.

**Karoo System.**—The examination and mapping of the Karroo rocks has enabled considerable additions to be made to our knowledge of the peculiar local development of the system. In the Umguzu valley Mr. Macgregor found that the beds were divisible into two groups, the Forest Sandstones below being overlaid by the Nyamandhlovu Basalts and Sandstones. The Forest Sandstone comprises the fine white unbedded sandstone together with some locally-developed red marls beneath it and the basal calcareous conglomerate. The newly-established Nyamandhlovu group consists of four alternations of sandstone and basalt lava without the natural top of the group being reached. There is a slight unconformity, due to contemporaneous erosion at its base. The sandstones are all coarse-grained, deep red in colour and strongly false-bedded. The lowest member of the group is a sandstone which is only developed locally, and has been quarried as a building stone in several places. All these inter-bedded sandstones are lenticular, and die out in one or other portions of the area. In addition to their lenticular form, their upper surfaces are undulating, and Mr. Macgregor was able in several instances to prove the existence of sand dunes which were formed by winds blowing from the north-east. The lowest beds of the Forest Sandstone bear evidence of the action of water, though probably only its periodic action. Generally speaking, it may be said that the two groups were accumulated on a land surface in an arid, if not a desert, climate. Although a careful search was made for fossils in all likely places, no new localities were found. With reference to the question of the existence of "deep leads" beneath the Karroo rocks, it is disappointing to have to report that little fresh evidence of the nature of the pre-Karoo floor, or of the deposits lying in its hollows, has been obtained, and it is not such as to encourage prospecting for auriferous "deep leads." It is almost certain that the excellent building stone quarried at Paspas, which was used in the construction of the Municipal, Customs and Post Offices in Bulawayo, belongs to the basal sandstone of the Nyamandhlovu group. In any case, it may be taken as certain by those in search of building stone that better material will be found amongst the sandstones of the Nyamandhlovu group than in the thicker and more conspicuous Forest Sandstone beneath.

**Kalahari System.**—One of the most interesting results of the examination of the district is the recognition by Mr. Macgregor of a deposit of sand with a bed of pisolitic ironstone at its base lying unconformably on the Karroo rocks. Between the Umguzu and Khiani Rivers these beds cap many of the higher hills, and stretch westwards beyond the limits of the mapped area, where the sand above the ironstone becomes much more important. This sand was correlated by Passarge with his "Kalahari Sand," and there seems no reason to doubt the correlation. It covers the country over the eighty-mile stretch on the Victoria Falls railway line between Gwaai and Dett sidings; and between the Dika River and the Victoria Falls it occurs in "bulks" frequently with the ironstone and chalcidonic quartzites at its base resting upon the basalts. In the neighbourhood of Bulawayo the ironstone rests on Forest Sandstone near the R.N.L.B. compound, and on the Hillside syenite south of the town. These high level ironstones, which are covered by sand whenever the outlier is sufficiently large to allow it, are evidently part of an originally continuous deposit, and are evidence of the former wide extension of the Kalahari Sand. These results are of the greatest assistance in filling in what has hitherto been a blank page in the geological history of Southern Rhodesia. It appears that after the consolidation of the last basalt flow of Karroo times a period of denudation set in, during which the Karroo deposits were reduced almost to their present limits of outcrop, as is seen by the occurrence of Kalahari ironstone resting on the schists not far from the sandstone outcrop. Since the process continued for a long time, and the only evidence of the rivers which produced this denudation exists as high-level deposits

(Somabula Beds) and gentle features, it is probable that the country stood at that time at a height but little above sea level. On the peneplain thus formed the Kalahari Sand was deposited far and wide, and formed at its base the pisolitic ironstone which frequently caps the higher hills at the present day. Mr. Macgregor points out that the present river system shows, in the great number and parallelism of its consequent streams, that it has originated, geologically speaking, in comparatively recent times. It is now clear that the river system developed upon the surface of the Kalahari Beds. At this time a slight axial elevation took place and was accompanied by a moister climate, which may indeed have been a result of the elevation, and from a line near the present watershed, consequent streams began to flow north-westward and south-eastward, and ultimately developed into the present river system. Since this time the climate has undergone several changes, which are shown by the nature of the river alluvia, and are outlined in the sequel. It is thought that sufficient grounds have been given for the establishment of a Kalahari system, consisting in the main of the Kalahari Sand with the ironstone and chalcidonic quartzite at its base. Mr. Macgregor considers that the ironstone was formed by precipitation from solutions percolating downwards through the sand. This view agrees with that of Mr. G. W. Lamplugh, F.R.S., who examined the Victoria Falls region in 1905, and differs from that of Passarge, who thought the ironstone was much older than the sand. The outlier of red sand with ironstone crossed by the railway north of Gwelo almost certainly belongs to the Kalahari system, and in last year's report the resemblance of the red sand forming the uppermost member of the Somabula diamondiferous beds to the Kalahari Sand in the neighbourhood of the Victoria Falls was pointed out. It is now suggested that the Somabula beds should be classed with the Kalahari system, the lower group of river-formed gravels being considered as a relic of the river system which eroded the peneplain whereon the Kalahari Sand was spread at a later period. The age of the Kalahari system must remain for the present a matter of doubt. Passarge considered that the Kalahari Sand was post-glacial, but in view of the relations with the river system of Southern Rhodesia now demonstrated, and of the cycles of change which have taken place since that river system was established, it is clear that the Kalahari beds are of greater antiquity. For the present it is probably safe merely to date the Kalahari system within the tertiary era.

(To be continued.)

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**ENEMY TRADING ACT: OFFICIAL MEMORANDUM.****Explanation of Chief Points.**

All official explanatory memorandum on the Trading with the Enemy Act has been issued by the special branch of the Treasury which has been created to administer the Act. It sets forth that for the purpose of the Act the term "enemy" means any person or body of persons in an enemy territory, but "enemy territory" does not include territory in military occupation by the British or Dominion forces, e.g., German South-West Africa or parts of German East Africa. On the other hand, territory in military occupation by the enemy, e.g., Belgium, Northern France, and Serbia, would be considered enemy territory. Any person who does business or is resident in enemy territory is an enemy, but the subject of an enemy State who is living outside enemy territory is not an "enemy." Therefore an enemy subject interned in the Union is not an enemy for the purpose of the Act. A person is deemed to have traded with the enemy if:—(a) He has taken part in a transaction or done any act which at the date thereof was prohibited; (b) He has attempted, or directly or indirectly offered, or proposed, or agreed to take part in any such transaction, or to perform such an act; (c) Without lawful authority he has in the Union aided or abetted any other person outside the Union in entering into, negotiating or completing any act which, if done within the Union, would have constituted an offence; (d) Without lawful authority he has dealt, or attempted, or offered, proposed, or agreed, directly or indirectly, to deal with any money or security, property or assets for the purpose of enabling an enemy to obtain money, or property, assets, or credit; or (e) He has taken part in any transaction or performed any act which in English or Roman-Dutch common law, or by this Act, or any other law, constitutes trading with the enemy.

Where a company has committed any offence every director, manager, secretary, or other officer of the company who is knowingly a party to the transaction is deemed guilty of the offence, and in the case of a firm or partnership every member of such firm or partnership who is knowingly party to such transaction is deemed guilty of the offence. An "enemy subject" means a person of enemy nationality, or a subject of a State for the time being at war with His Majesty, and includes a body corporate constituted according to the laws of such a State.

**PROPERTY OF ENEMY SUBJECTS.**

Every enemy subject who is within the Union is called on to make a return of all stocks, shares, etc., and all other property belonging to him, or in which he is financially interested. The official form for making these returns is known as Registration Order "K." Every enemy subject and every enemy firm or partnership of which any partner is an enemy subject, and every company of which any shareholder or debenture-holder is an enemy subject, and every person or agent carrying on business on behalf of such person, etc., must, before July 22, 1916, notify the Treasury of such fact, and furnish any information relating to the business that the Treasury may require. An appropriate form is available for this purpose and can be obtained on application. No returns have to be made to the Custodian in respect of any of the above matters on behalf of persons resident or carrying on business in territory in hostile occupation, i.e., the Trading with the Enemy Act does not apply to a resident in Belgium, but it should be most carefully noted that the Trading with the Enemy Proclamations do apply to persons resident in or carrying on business in territory in hostile occupation. The effect is that no sum can be remitted to occupied territory, but that it is not payable to the Custodian, neither is any property held for such persons registerable with him. Every person who holds or manages or has, since the 11th of August, held or managed any property belonging to an enemy must, under penalties, make a return of the property so held or managed to the Custodian on the appropriate form. It does not matter in what capacity the holder of the property acts, e.g., as trustee, nominee, agent

representative, holder in safe custody, carrier, etc., it is he who is responsible for the making of this return. The official form used for making the return is Registration Order "L" for safe custody holdings, and Registration Order "B" for all other holdings. All bank balances and deposits of £50 or upwards, due to enemies must be recorded with the Custodian. The return including a return of bank balances and debts is known as registration order "F." The word "person" is taken to include any partnership or company or any corporate body for the purpose of this section. Every partner of an enemy firm in which one or more partners is or are enemies must make a return to the Custodian of the enemy capital invested in the firm, and every company which, though not incorporated or registered in the Union, has a share transfer or share registration office in the Union must make a return to the Custodian of all shares held by enemies. The official form required for making these returns is known as registration order "C."

**MONEYS TO BE PAID TO CUSTODIAN.**

The Trading with the Enemy Proclamation No. 2, September 9, 1914, issued by the King and published in the "Union Gazette," September 22, 1914, forbids any person resident or carrying on business in this country to make any payment, directly or indirectly, to or for the benefit of an enemy. Hence, many payments which would have been made to enemies if there were no war have not been made, or will not be made when they fall due. Of these unpaid sums it should be carefully noted that the following must be paid over to the Custodian: (a) Interest and dividends payable by incorporated companies, or interest on securities issued by or on behalf of any Government, British or foreign, or any Corporation or any Municipal or other authority whether within or without the Union; (b) Profits due to enemy partners or enemy owners of businesses; (c) Interest on loans made by enemies for the purpose of a trade or business; (d) Rents. Any sum which may become due to an enemy by way of payment off of any securities which have become repayable on maturity, or by being drawn for payment or otherwise, must also be paid over to the Custodian. It will be noted that severe penalties are prescribed in the Act for neglect to make the necessary returns.

**CREDITORS OF ENEMY SUBJECTS.**

The Trading with the Enemy Act, 1915, institutes a method by which a creditor of an enemy debtor may obtain satisfaction of his debt, provided that his enemy debtor has assets in the Union. The first thing to do is to ascertain whether, as a matter of fact, such assets (including debts) do

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exist, and this can be ascertained by applying to the Custodian for a form of search. When this is returned to the Custodian, duly filled in, the records of the branch will be searched and any available information forwarded to the person making the inquiry. Persons are entitled to make an inquiry who appear to the Custodian to be interested as creditors or otherwise. When the existence of enemy assets has thus been ascertained, the next step is to apply to the Court by means of an application to have the assets in question vested in the Custodian for the purpose of satisfying the debt. If the Court make the order other creditors are duly advertised for and the Custodian, under the direction of the Court, proceeds in the distribution of the assets.

### **BRITISH PROPERTY IN ENEMY COUNTRIES.**

It has been arranged that the Custodian shall receive and record any claims of persons resident or carrying on business in the Union in respect of property belonging to them in enemy countries or in territories in the occupation of the enemy. It must be distinctly understood that this return is a voluntary return, and that the object of the Custodian in asking creditors of enemy firms or persons to make these returns is merely to make a record. The forms which are supplied to the public for the purpose of making this return are as follows: Registration order "G," to be used for making a return of bank balances held by enemies and debts due by enemies to British firms or persons. It should also include unrepresented bills accepted by and unrepresented cheques drawn by enemy firms or persons. It should be noted that unpaid dividends and uncashed coupons are debts and should be recorded on registration order "G." Registration order "H," to be used for making a return of all property in enemy or occupied territories. It should include public securities of all enemy countries, whether the paper titles to these securities are held in this country or not. It is essential that the actual value of the property so held, and not merely its face value, should be recorded, and in estimating these values the following rules should be observed: (1) In all cases where sales in the securities are now taking place or have taken place since the war began the prices realised at such sales should be taken as the basis of the valuation. (2) In other cases where no such sales have been made, the value should be the value on August 1, 1914, or on the latest date previous to August 1, 1914, on which a price was recorded. (3) In cases where lands, houses or leases are included in the return the value recorded should be the estimated capital value as on August 1, 1914, less the estimated capital value of any charges on the same.

### **Village Main Reef.**

The report for 1915 states that the net profits amounted to £110,796, against £295,790. The dividend was reduced from 14s. per share to 4s. per share; £14,605 is written off for depreciation, leaving a balance to be carried forward of £245,611, against £243,820. The directors now recommend the payment of an interim dividend of 2s. per share, free of tax, on account of 1916.

### **New Kleinfontein.**

The following are details of the operations on the New Kleinfontein Company's property for June:—Stamps, 200; days, 28,633; tube mills, 4; tons milled, 49,000; gold recovered, 15,225'334 fine ozs.; net value, £63,187 11s. 8d.; profit, £10,557 15s. 11d.; working costs (excluding development), 19s. 8'778d.; development to working costs, 1s. 9'000d.; total working costs, £1 1s. 5'778d.; capital expenditure, New Klein section, £65 11s. 7d.; capital, expenditure, Apex and Benoni sections, £15,994 0s. 9d.; maintenance expenditure, Apex and Benoni sections, £983 13s. 8d. Note.—The decreased profits are due to heavy expenditure in connection with starting up of the new plant and to reduced revenue on account of smaller tonnage owing to influx of inexperienced and inefficient natives amounting to 1,700 for the two weeks ended 14th June last, and to breakdown of tube mill circuit, which has now been rectified.

### **Glynn's Lydenburg.**

The following are the particulars of Glynn's Lydenburg, Ltd., output for the month of June, 1916:—Tons crushed, 4,115; yielding 1,548'269 fine ozs.; estimated value of month's output, £8,516; estimated profit for the month, £3,808. The output and profit include £2,025, from by-products.

### **Zaaiplaats Tin.**

The results for the month of June, 1916, were as follows: Days run, 26 days; ore milled, 2,639 short tons; residues re-treated, 442 short tons; concentrates won, 31 long tons; average value of concentrates, 65 per cent. M.T.; estimated less for the month, £1,422 18s. 8d. Add adjustments in respect of estimated values of previous shipments, £481 4s. 2d.; loss declared for the month, £1,904 2s. 10d.; capital expenditure, nil. Note.—Revenue for the month has been calculated on the basis on tin at £165 per ton.

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## THE ADVANTAGES OF THE METRIC SYSTEM.

THE following address on the Metric System was delivered before the South African Association for the Advancement of Science by Mr. R. T. A. Innes:—

The metric system is the most important decimal system, and it is more than a mere decimal system; it is a system in which measures of weight, length, area, and capacity are all simply interrelated. In the "Journal of the Royal Society of Arts," No. 3,293, of 31st December, 1915, Colonel Sir Charles M. Watson makes a spirited defence of the English measures of length, which in his last paragraph he claims to be prehistoric. Now, there is a good deal to be said for our inch, foot, yard, and mile, cumbrously as they are related to each other. But too much should not be said. The English here has no obvious, or, indeed, simple relation to any one of them. The side of an acre square is 24 by 10 yards, which is a bad co-ordination. But if we give way on measures of length, what about those of capacity and weight? That is just it. We have to learn three distinct systems, not one of which is the decimal notation or any other notation, but a mixture. We may learn these systems, but they are so artificial that unless we use them regularly we must perforce forget them. In practice I find a millimetre a very convenient starting point, and for mental estimation I remember 25 millimetres (25mm.) are equal to the length of the middle bone of my little finger, or about an inch, and that a metre is, roughly, equal to a yard, and is 1,000mm. A millimetre is the smallest distance which can be conveniently or easily seen by the eye. One can visualise a yard or a metre, but I do not think that without actually measuring anyone could distinguish between a yard and a metre length if shown individually. A cubic metre of water weighs a ton (a metric ton), which is sub-divided into 1,000 kilogrammes. A metric ton is equal to 2,200 lbs., an English ton to 2,240 lbs., and a short ton (such as our ton of coal in South Africa), 2,000 lbs. But the especial point to notice is that a cubic metre of water weighs a ton, because if so, a cubic metre of anything else weighs its specific gravity in tons. What simplicity! The specific gravity of iron is 7.8; therefore, a cubic metre of iron weighs 7.8 tons, or 7 tons 8,000 kilogrammes. The specific gravity of oak or beech is about 0.75; therefore a cubic metre weighs three-quarters of a ton, or 750 kilogrammes. For liquids measures of capacity are generally used, and capacities differ, though some liquids should be, and are now sold by weight, such as sulphuric acid. In English measures we have a pint of water, weighing a pound and a quarter, and a cubic foot of water weighs 62.4 lbs. Here are the metric relations: A 100-millimetre cube of water contains one litre, and weighs one kilogramme. The system is so simple that once one has handled and studied a cube litre, these simple relations can never be forgotten. Colonel Watson believes that if England adopted the metric measures of length it would be to Germany's benefit, but I cannot follow his reasoning. Formerly Germany did employ measures of length corresponding to our inches and feet, and it deliberately abandoned them for those of the metric system. None of us will be so foolish as to assert that in the race for commercial supremacy Germany would deliberately handicap Germans by adopting a second-rate system of weights and measures. I will, however, offer an entirely different argument in favour of the adoption of the metric system. In these days of truly international trade and exchange, the advantage of one uniform system is self-evident. The question is: Which system is it to be? At the beginning of last century there were the metric system and the English system—one legal in France, the other in British possessions and the United States. Which has made progress? The metric system alone! It has been adopted by one country after another, until the only outstanding countries of any importance are Russia, Japan, and the United States, but these countries have systems based upon metric standards, and mainly decimal in character. In the United Kingdom the metric system is permissive. Holland, Portugal, and South America use solely the metric system. Hence it has made great strides, and no nation having once adopted it has ever abandoned it. It must, therefore, be accepted that it is a good system. On the contrary, the

English system has continuously been losing ground. Some British possessions, such as Malta, Mauritius, and the Seychelles, have made the metric system compulsory—not perhaps very important possessions in themselves, but they indicate the direction of change. As to the English-speaking peoples themselves: In schools pupils are taught both, and if they progress to science classes they are taught to use almost exclusively the metric system. Thus they are in an unfortunate position. They have to remember best as they can two systems. At least it is a handicap which Germans and others avoid. But in pharmacy, both in the United Kingdom and in the United States, the metric system is now alone used, and in the diamond trade the metric carat has been universally adopted. Expediency is, therefore, an additional argument in favour of the adoption of the metric system, to the exclusion of all others. When we come to the decimalisation of the coinage, the demand is slightly different. It is only demanded that the pound sterling should be decimalised, by dividing it into 1,000 parts. There is no suggestion that we should express the pound in terms of the dollar or 20-franc or mark-piece. The present and the suggested coinage would compare as follows:—The 1,000 parts would be called mils, and as one pound is equal to 960 farthings, one mil would be equal to one farthing within 4 per cent. The decimal coinage would be as follows:—Sovereign. Same value as at present: Half-sovereign: Same value as at present, equal to 500 mils. Silver.—Florin: Same value as at present; equal to 100 mils. Half-florin: Same value as the shilling; equal to 50 mils. Quarter-florin: Same value as the sixpenny piece; equal to 25 mils. Cent: Nearly equal to threepenny piece; equal to 10 mils. Nickel.—N.B.: The threepenny piece is equal to 12.5 mils. Demi-cent: Equal to 5 mils. Copper.—The penny: Equal to 4 mils. Half-penny: Equal to 2 mils. Farthing or mil: Equal to 1 mil. The new penny of 4 mils would be 4 per cent. less in value than the present penny. If the new penny was the unit for penny postage, then the cent would be the cost of the present 2½d. foreign postage. It will be seen that practically all our present coin values would be maintained. In accounts the values would read as follows:—£1, 1,000; florin, 0.100; half-florin, or shilling, 0.050; quarter-florin, or sixpence, 0.025; cent, or "tickey," 0.010; penny, 0.004; mil, 0.001; and articles be priced in mils. Thus "cheap at 1s. 11½d." would be "cheap at 99," and "bargain at 5½d." would be "bargain at 24," as mils would be habitually omitted, as is the custom in the United States with cent values. Articles over £1, such as, say, £1 2s. 6d., would be written 1.125. Without some practice the price of three articles at 1s. 11½d. and of two at 5½d. can hardly be done mentally, but in the mil coinage it is quite simple, namely, 350, less 5, equals 345 mils, equals 3 florins 1 quarter and 2 tickeys. In the present coinage it would be 6s. 10½d., equal to 3 florins, 1 sixpence, 1 tickey, 1 penny, 1 half-penny, and a packet of pins. Calculations in interest and discount become simple. In all considerable interest, and especially in compound interest sums, it is necessary to convert our present coinage into decimals, work the sum, and reconvert into £ s. d. This circumlocution will be avoided when a decimal system is adopted. The general adoption of decimal system will greatly simplify the teaching of children, and liberate time for other and more profitable study, business operations will be facilitated, and account books more simply ruled. I believe the difficulties of the transition stage tend to be exaggerated. Those who have travelled abroad will have personal experience of how short a time it takes to get accustomed to strange money.

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## RESEARCH AND THE ORGANISATION OF INDUSTRY.—II.

Address by Professor Wilkinson.

If we are to build an edifice consecrated to the future progress of our race in this country, where, owing to our native population, self preservation itself demands efficiency and leadership means excellence, it is our bounden duty that the advancement of Science shall permeate the mass and be understood of the common people. Our workmen, too, must drink of the fountain, so that even routine operations may reflect scientific skill and the atmosphere of science our dominance. The realisation of our hopes is the mission of our youth, and our assistance in the provision of the fullest means for its achievement must be forthcoming in boundless plenty. The rule-of-thumb artisan, who is merely waiting for the whistle to blow, must give place to the workman trained to direct his energy with innate and acquired skill, and more especially with some knowledge of the physical and chemical properties of the materials he employs. Conservatism, worship of tradition, ignorance of the discoveries of modern science, and failure to apply them, are grievous sins in workmen and heinous crimes in those who control and direct industry, and the country which allows these weeds, not merely to exist, but oftentimes to flourish, is doomed to an early grave in the fellowship of nations. South Africa has been endowed beyond measure with rich stores of useful minerals, and whilst these are being exploited she is dependent entirely on others to supply her most elementary wants. Thoughtless criticism might saddle me with lack of a due sense of proportion in that the economies of these possible industries have been left wholly out of consideration. In this regard I maintain that the duty of a country is to its own people, and the primary necessity is to furnish, as far as it can do so, its own immediate requirements. South Africa is not nearly at present as self contained as is possible, and hence the necessity for the establishment of chemical industry in our midst is in every sense a vital one. Private enterprise has to some extent made a beginning, as illustrated by the success of the soap and cement factories established within the last few years, but the coal industry is still confined to the utilisation of the raw material, accompanied with the waste and loss of its most valuable by products. I am well aware of the fact that recently an ammonium sulphate industry has been started in this Province, but in this case also by products of considerable value will be lost. There are two points of view which make this particular industry of supreme importance—first, the defence of the country; and, secondly, conservation of its natural resources. Phenol, benzene and toluene are three of the most important distillates obtained from coal tar, and, apart from their own use as motor fuels, when treated with nitric acid these substances yield on the one hand the highest explosives at present known, and on the other hand the mother substances for the preparation of dyes, drugs and perfumes. Much has been heard since the commencement of the war on this latter subject, owing to the fact that the textile industries of Great Britain were so absolutely dependent on Germany for these products that, for a short time, their position was extremely critical. This subject is, to the chemist, certainly one of the most attractive within his vision, but it would be superfluous to deal with it here, because I am of the opinion that the day is yet distant when its institution can be profitably discussed in South Africa. On the other hand, if war and the creed of a spurious superman are to continue their existence, the manufacture of explosives from our own resources is a necessity, neglecting for the moment their use in mining, engineering and agriculture. These, however, are not the only substances which would justify the inception of a tar distillation industry in this country, as a perusal of the short list given will readily show. The second point of view put forward is that conservation of natural resources should constitute one of the primary functions of Government, and as, according to the statistics of the world's coal resources collected recently by the International Geological Congress, the quantity of coal we possess is but four-fifths of 1 per cent. of the total amount known to exist in the world, this statement should require no advocacy on my part with respect to a substance so rich and fertile in its already known potentialities. Parenthetically, I may remark here that the subject of national conservation is one which has not yet been taken up by this Association, but its close and intimate connection with development should make it a matter for serious consideration even now. In the United States of North America, which is one of the portions of the earth most richly endowed by Nature, much preliminary work has been done upon this subject, and the publications of the Government Com-

mission, as also the addresses and papers of some of its foremost scientific workers, are worthy of careful study. South Africa is still a young country, but in the evolution and development of its heritage it must seek to take advantage of the experiences of this nature which other countries can show. The late Lord Beaconsfield once said that the prosperity of a country could be gauged by the extent of its chemical industry, a statement which was received by his contemporaries with scorn and derision. The years which have elapsed since then have proved, as is often the case, that his words were not the accident of an impulsive verbosity, but the reasoned verdict of a deliberative mind. The realisation of this dictum has been most profoundly shown by the stupendous progress in chemical industry made by Germany during the last forty years, more especially in the domain of organic chemistry. It may appeal to some to state here that their great chemical factories, each with a capital of from one to two million pounds, paid dividends out of profits varying from 14 to 30 per cent. in 1913, and as a specific example may be quoted the firm of F. Bayer and Co., of Elberfeld, which, on a capital of £1,800,000, made a net profit of £335,092, figures which remind one of a rich Transvaal gold mine. Loser concerns show proportionate results. From the point of view of the present conflict, these factories, with their vast chemical equipment and organisation, are among the greatest national assets of their country, and it is by no means beside the mark to state that, without her chemical industries, Germany would never have been able to continue the struggle. If we leave out of consideration the exploitation of her metalliferous minerals, which will in the not far distant future be but memories, South Africa may be considered as a country where chemical industry is, practically speaking, non-existent. Hence to prepare the nation for the future prosperity we should so earnestly desire to see attained, the obligation rests upon this generation to develop at the earliest possible moment those chemical industries, in the first place, needful for its own existence, and only when this has been achieved to attempt an expansion beyond its borders.

The second portion of my theme relates to the organisation of chemical industry and the part which research should play therein. So much has been written upon this subject since the war began that it requires some amount of courage to add to the already voluminous literature bearing upon it, and, in venturing to do so, I cannot hope to do more than give a brief survey, one which, however, will relate more especially to the conditions as they exist in this country. Reference has already been made to the enormous progress which Germany has made in this direction, but unfortunately it has required a war of the present dimensions to pierce the armour-plated conservatism of the governing classes in England, and even yet it is a matter of grave doubt whether much impression has been made. The force of precedent and example within the Empire in all its affairs is so dangerous that in many respects it should be classified as a disease and treated accordingly. But this is a phase of mentality which so far has been outside the vision of those to whom we have entrusted our destinies. It should, however, in this respect be noted that the agitation for the endowment of scientific education and research on the one hand, and the scientific development and control of industry on the other, is a theme upon which the leaders of science and contemporary thought have never wearied to dilate since Germany first began to rival her competitors and then leave them behind in the race for industrial supremacy. Patent laws and other legislative expedients of a like artificial nature are but momentary impedimenta in the path of modern scientific industry, and soon melt away like the proverbial dew. It will suffice to mention the comparison between the great anticipations and their realisation when, a few years ago, Mr. Lloyd George attempted by such legislation to transfer in some degree German chemical industry to Great Britain. Tariffs may protect the birth throes of industries, whose sponsors are fully conversant with modern methods of their exploitation, and utilise this knowledge to the fullest extent in their control, but otherwise they provide an illustration of a futile and impotent waste of energy, such as any scientific man would most rigorously condemn. By way of preface it would, perhaps, at this stage be of interest to take a few illustrations of the manner in which some of these industries have risen to their present state of flourishing activity, and, although the story is an oft repeated tale, constant reiteration does not yet seem

# WRIGHT'S ROPES.

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to have brought home the lessons it teaches. I shall first refer to the synthetic preparation of indigo. This example is at the present moment the most fitting one which, I think, could be chosen, since it bears the closest possible resemblance and analogy to an industry upon which much of the prosperity of this particular Province is directly dependent, namely, the tannin industry. The synthesis of indigo was first accomplished by Nencki in 1876, but it was not until Baeyer and his pupils had five or six years later thoroughly investigated and proved its constitution that simple methods for its synthesis became available. The next step, namely, the translation of the laboratory methods thus discovered into commercially economic processes proved a source of extreme difficulty, in which success was only achieved after nearly one million pounds had been spent on innumerable and laborious experiments, and at the end of 17 years' work artificial indigo prepared from the naphthalene of coal tar being first put on the market in 1897. If anything can excite our admiration, surely this example of one of the finest industrial achievements known to science should do so. The result of this vast amount of labour and expenditure, which, it is needless to say, would not have been incurred had the consequences not been clearly and precisely foreseen, is shown in the following table given by Professor P. F. Frankland in an exhaustive paper on the chemical industries of Germany last year.

## INDIGO.

	BRITISH EAST INDIES.		GERMANY	
	Cwts.	Value of Exports.	Imports.	Exports.
1896 ...	188,337	£3,569,670	£1,036,000	£319,550
1899 ...	135,187	1,980,319	115,450	392,250
1902 ...	89,750	1,234,837	184,350	923,100
1905 ...	49,252	556,405	60,100	1,286,050
1908 ...	32,490	424,849	14,100	1,932,750
1911 ...	16,939	225,000	22,300	2,091,500
1913-14 ...	60,000 to 70,000			

In 1895-96 the acreage under cultivation was approximately 1,400,000 acres, and on December 31st, 1915, the Indian Trade Journal (Calcutta) published an estimate that the total area in 1915 was 314,300 acres, as compared with 148,100 acres in 1914, this increase being due to the high prices ruling on account of the war and the cessation of the German industry. The total yield was estimated at 39,900 cwt., as against 25,200 cwt. the revised estimate for 1914-15, and the average output per acre 14lb., as against 19lb. in the preceding year. The price of indigo (100 per cent.) in 1897 was 16s. per kilo, and in 1913, 7s.

The tin production of the world is about 120,000 long tons annually. Over half of this comes from the Federated Malay States, while Bolivia contributes 18 per cent. The Dutch islands, of Banka and Billiton, in the Java Sea, just south-east of Singapore, rank next to Bolivia in importance. Cornwall produces 6,000 tons annually, as do also South Africa and Nigeria combined, while Australia and China contribute 4,000 tons each. Cornwall has been famous for tin since prehistoric times, and forty years ago its output was at the rate of 12,000 tons per annum. The North American continent produces practically no tin—only a trivial amount from Alaska. The bulk of the American consumption of tin—and the United States is the largest user of tin in the world—goes to make cans for preserving the plentiful output of salmon, beef, vegetables, fruit, etc. The valuable property of not tarnishing and of being resistant to the decomposing action of air, water, and the common acids and alkalis is what makes tin preferable for plating iron for cans. Tin ore from Bolivia, unlike Straits tin, is said to contain iron, which lessens the adhesion of the tin to iron plate. According to the "Mining and Scientific Press" this militated against the importation of Bolivian tin into the United States, until the method of electrolytic refining became practicable. The tin of Bolivia is found associated with silver, and some of the mines were worked originally as silver mines. The region lies at an elevation of 8,000 to 17,000 feet above the sea, being on the bleak Bolivian plateau. Previous to the War the smelting of Bolivian tin was divided about equally between Germany and England. Much of the Straits tin is smelted by the Straits Trading Company on the island of Pulo Brani opposite Singapore. The Dutch Government has a smelter at Banka, and markets its product both in Holland and Java. One reason why Straits tin has dominated the market is because most of it is recovered from alluvial deposits that are worked cheaply by Chinese labour and dredges. The Nigerian tin also is all of alluvial origin.

## PERSONAL.

The first monthly general meeting of the South African Institution of Engineers, in the 1916-1917 session, will be held in the Council Chamber of the Chamber of Mines this (Saturday) evening, at 8 p.m.

Mr. W. Ingham, Chief Engineer of the Rand Water Board, has kindly invited members of the South African Institution of Engineers, to visit the Zuurbeekom Waterworks, on a date in September to be fixed. Full particulars will be announced later.

## Standing Committee on Mining.

The Advisory Council for Scientific and Industrial Research has formed a Standing Committee on Mining, to represent both the scientific and industrial sides. The following members have been nominated by the Institution of Mining Engineers—Sir William Garforth, Dr. John Haldane, F.R.S., Dr. R. T. Moore, Mr. Wallace Thornycroft; by the Institution of Mining and Metallurgy—Mr. Edward Hooper, Mr. Edgar Taylor; by the Iron and Steel Institute—Professor H. Louis; and by the South Wales Institute of Engineers—Mr. W. Gascoyne Dalziel. The Advisory Council has appointed: Sir Hugh Bell, Bart., Mr. Hugh Bramwell, Lieut.-Col. W. C. Blackett, Professor Cadman, Prof. Frecheville, Mr. Bedford McNeill, Mr. Hugh F. Marriott, Sir Boverton Redwood, Bart., and Mr. C. E. Rhodes, with Sir William Garforth as chairman. The Committee is divided into two sections:—(1) Mining of Iron, Coal, and Hydrocarbons: Sir William Garforth (chairman), Sir Hugh Bell, Bart., Mr. Hugh Bramwell, Lieut.-Col. W. C. Blackett, Prof. Cadman, Mr. W. Gascoyne Dalziel, Dr. John Haldane, Prof. Louis, Dr. R. T. Moore, Sir Boverton Redwood, Bart., Mr. C. E. Rhodes, and Mr. Wallace Thornycroft. (2) Mining of Minerals other than Iron, Coal and Hydrocarbons: Mr. Edgar Taylor (chairman), Sir Hugh Bell, Bart., Prof. Frecheville, Mr. Edward Hooper, Prof. Louis, Mr. Bedford McNeill, and Mr. Hugh Marriott.

## The Sheba G.M. Co.

Particulars of the output of the Sheba Mine for the month of June, 1916, are as follows:—Crushed, 6,313 tons; yielding 2,516 fine ozs.; working expenditure, £6,970; development, £1,861; capital expenditure, £2,077; estimated profit, £1,881.

MAGADI SODA.—The accounts of the Magadi Soda Company, Ltd., for 1915, show a debit balance of £17,558. The directors point out that although they started trading the proceeds of sales were so infinitesimal as to preclude writing off anything during the year for depreciation of works and machinery. The company has not been able to continue the distribution and selling of the soda in its raw ground state. After having made sample shipments to various markets, the company was forced to cease operations by reason of the fact that the military authorities in British East Africa have taken possession of the line and are unable to give the company facilities for conveying the soda from the lake to the coast for shipment.

WEST RAND CONSOLIDATED MINES.—It is announced by the West Rand Consolidated Mines that the company has purchased £25,000 of the 6 per cent. Debentures in respect of the redemption due on September 1. The redemption will be deemed to be a drawing as on that date, and no such drawing will, therefore, be made. Debentures now outstanding amount to £125,000. The company invites offers of additional Debentures, which it is prepared to purchase to the extent of £50,000 nominal. The Debentures will be purchased with Coupon No. 14, due 1st September, 1916, and onwards attached, and tenders stating the amount and price at which holders are prepared to sell must be lodged not later than twelve noon on the 20th inst., with the London Secretary, Winchester House, Old Broad Street, E.C.

## Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

### "Fortunes for Inventors."

To the Editor, *South African Mining Journal*.

Sir,—The prominent position and space given in your and other papers recently to articles on fortunes awaiting inventors, lead to the conclusion that among others, inventions such as referred to in connection with the mechanical transmission of power are of great importance and likely to deserve public consideration. The world to-day is wasting probably more than half of the fuel consumed to energise prime movers. This waste is likely to exceed a million pounds sterling daily. With regard to the suggested invention for an economical device capable of converting the high speed of motors into suitable speed for operating driving wheels and propellers without great loss of energy, I may say that such is not only possible but has already been done. I have before me now drawings and details of a comparatively simple device, based upon sound engineering lines, by which power may be taken from a prime mover at, say, 10,000 revolutions per minute or more or less, and delivered to other machines or working parts at any desired rate of speed down to one revolution per minute, in varying and/or variable speed and amount. This is performed without slip at an efficiency for the whole transmission exceeding 90 per cent., and at an initial expense comparable size for size with the motor-gear box. This invention is open for adaption and use by any public company or concern which will undertake to exploit and put it on the world's markets, within a given time to be agreed upon, and one-half of the "fortunes awaiting inventors" may be retained by the said company or concern as compensation for the exploitation. It is also well-known to engineers that, apart from the losses due to transmission of power of every 100 pounds of fuel used in an internal combustion engine, such as the car motor, not less than 46 pounds is dissipated to waste by radiators, cooling devices and through exhaust gases, while in the steam engine, out of every 100 pounds used not less than 73 pounds is sheer waste. I have now also before me drawings and details of a new prime mover, designed to operate upon the soundest scientific lines, so as to return in power available for doing external work, 83 per cent. of the heat energy contained in the fuel employed. This invention is also open for adaption and use by such public company, concern, government or person who shall first deposit not less than £2,000 in a Johannesburg bank for use in exploiting the invention in a manner to be first agreed upon and signed, and two-fifths of the "fortunes awaiting inventors" may be retained by the exploitation company or party. It is estimated that these inventions will save one-half of the world's fuel consumption. I am, etc.,

E. P. JERRARD,

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P.E.—In evidence of bona fides, copies of references are enclosed.

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### The Navy League.

To the Editor, *South African Mining Journal*.

Sir,—Navy Comforts Fund, Navy League—Victoria F. and T.P. Co., Employees. Please allow me space to acknowledge with thanks the amounts: Simmer Pan Station, £6 10s.; Robinson Deep Compressor Station, 8s. 9d. The amount, £6 18s. 9d., has been sent to Headquarters by Standard Bank Draft, No. 13366—31-1925.—Yours, etc.,

KENNETH AUSTIN,

Royal Navy Comforts' Fund, Navy League.

### Leeuwpoort Tin.

The quarterly report of operations is as follows:—Report of operations for the quarter ended 30th June, 1916, as follows: Stamps, 17 (including 2 Nissen); time run, 84.65 days. Tons crushed, 12,493 short tons; concentrates won, 250 long tons. Average assay value of concentrates is 62.54 metallic tin. Average price of metallic tin on which the quarter's revenue has been determined is £180 per ton. Estimated profit, £6,768 4s. 2d. Adjustments in respect of previous shipments, £333 17s. 2d. Profit declared for quarter, £7,102 1s. 4d. Capital Expenditure.—The sum of £2,513 4s. 3d. has been expended for new tin dressing plant, machinery, buildings, shaft sinking, etc. During the quarter £3,123 5s. for development redemption has been included in working costs.

In view of the ever-increasing demand for gasoline and the increase in price of crude oil, from which it is obtained, it is important to know that an almost inexhaustible supply of oil may be obtained from the shale of north-western Colorado, north-eastern Utah, and south-western Wyoming (according to the United States Geological Survey). This shale contains materials which, when heated, may be converted into crude oil, gas, and ammonia. The high cost of distilling oil from shale as compared to the cost of producing oil from wells has thus far prevented the development in this country of such an industry and may continue to prevent it for some time, but sooner or later this great source of supply will be utilised to supplement the decreasing production from the regular oil fields. The oil derived from the shale is similar to that which is being produced from wells. When refined by ordinary methods, the shale oil yields an average of about 10 per cent. gasoline, 35 per cent. kerosene, and a large amount of paraffin. The yield of gasoline from the shale may probably be largely increased by the use of refining methods especially designed for that purpose. The gas, which is very good illuminating gas, will, perhaps, be sufficient to furnish all the heat required to distill the crude oil from the shale. The ammonia is a most valuable by-product of the distillation and may be utilised in the manufacture of commercial fertiliser or other nitrogen compounds, as the market demands. The United States Geological Survey has examined large areas of the shale in Colorado, Utah, and Wyoming, and has made many distillation tests. Some beds of shale that are several feet thick will yield more than a barrel of oil to the ton of shale, and one bed 6 in. thick will yield more than two barrels of crude oil to the ton of shale. One ton of this shale should therefore yield nearly 10 gallons of gasoline by the present commercial methods of gasoline extraction, and larger yields may be made possible by new methods.

## THE JUNE OUTPUT IN DETAIL.

The gold output for the Transvaal for June was declared this week by the Chamber of Mines at 761,764ozs., of the value of £3,235,767, being a decrease on the May return of 15,917 ozs. and in value, £67,610, due to the one working day short as compared with May. The following are the salient features:—

Total output	761,764ozs.
Decrease	15,917ozs.
Value	£3,235,767
Decrease	£67,610
Witwatersrand	735,194ozs.
Decrease	16,004ozs.
Value	£3,122,904
Decrease	£67,982
Outside districts	26,570ozs.
Increase	87ozs.
Value	£112,863
Increase	£372
Stamps	9,682

### DETAILS.

	Value £	Decrease £	Increase £
Aurora	18,189	1,147	—
Con. Langlaagte	64,314	3,051	—
Con. Main Reef	42,345	1,271	—
E.R.P.M.	197,562	11,010	—
Ferreira Deep	91,522	8,181	—
Ginsberg	15,479	1,168	—
Glencairn	13,593	365	—
Knight Central	29,891	2,073	—
Luipaardsvlei	24,161	149	—
Main Reef West	28,562	1,265	—
May Consolidated	9,957	811	—
Meyer and Charlton	35,145	243	—
Modder B	101,045	—	2,782
Modder Deep L.	72,071	—	4,953
New Goch	31,421	1,465	—
New Modder	118,274	1,185	—
New Primrose	17,390	777	—
New Unified	13,423	106	—
Princess	28,723	1,130	—
Rooodepoort U.M.R.	31,36	1,203	—
Rose Deep	77,878	3,292	—
Van Ryn	44,733	3,632	—
Van Ryn Deep	87,631	1,550	—
Village Deep	79,169	1,134	—
West Rand. Con.	42,141	1,763	—
Witwatersrand	55,616	89	—
Wit. Deep	55,012	—	1,949
Wolhuter	46,232	259	—
Durban-Rooodepoort	14,349	535	—
Durban Deep	33,489	816	—
Geduld Prop.	40,952	969	—
Government Areas	75,788	—	217
Langlaagte Estate	57,540	12	—
New Heriot	24,110	—	170
Randfontein Central	237,529	—	3,207
Robinson	74,055	—	1,708
Vogel Estates	12,294	2,014	—
West Rand Central	2,489	1,313	—
Village Main Reef	42,673	3,113	—
Crown Mines	22,016	7,047	—
Bantjes Cons.	23,375	—	2,013
Jupiter	26,174	—	297
Knights Deep	80,329	5,059	—
Robinson Deep	76,914	7,420	—
Simmer Deep	57,378	939	—
Simmer and Jack	65,406	2,286	—
Geldenhuis Deep	73,932	2,276	—
Nourse Mines	59,077	—	433
City and Suburban	51,971	552	—

Brakpan	92,979	2,795	—
City Deep	119,319	4,366	—
New Klemfontein	64,672	2,799	—
Miscellaneous	13,789	—	6,919

### OUTSIDE DISTRICTS.

Quest	1,886	493	—
Nigel	14,000	—	2,387
Burrett	1,563	—	272
Sheba	10,687	—	887
Sub-Nigel	16,553	982	—
Glynn's Lydenburg	6,575	319	—
Fairview T.C.L.	2,052	722	—
Trans. G.M.E.	34,627	2,413	—
Miscellaneous	24,920	—	1,755

### OUTPUT IN 1916.

	ozs.	Value £
January	787,467	3,314,948
February	753,591	3,201,063
March	796,689	3,384,181
April	751,672	3,205,643
May	777,681	3,303,377
June	761,764	3,235,767

### LABOUR POSITION.

Number of natives employed at the last day of the month by Witwatersrand Native Labour Association and Contractors:—

On Gold Mines	192,809
On Coal Mines	9,859
On Diamond Mines	2,105

204,773

The figures for May were:—On gold mines, 194,765; on coal mines, 9,811; and on diamond mines, 1,459; total, 206,035.

### Consolidated Gold Fields Group

The following are particulars in regard to the outputs and profits for the month of June, 1916, of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack	320	7	59,600	16,358	£23,178
Robinson Deep	130	8	50,600	18,633	26,501
Knights Deep	400	11	104,100	19,991	19,019
Simmer Deep	220	10	61,800	13,700	5,599
Jupiter	80	5	21,300	5,422	5,567
Sub-Nigel	30	2	7,520	3,797	3,470

Totals ... 1,180 43 304,920 78,491 £83,334

Reserve Gold.—Simmer and Jack, 1,340 ozs.; Robinson Deep, 2,438 ozs.; Knights Deep, 2,726 ozs.; Simmer Deep, nil.; Jupiter, 1,640 ozs.; Sub-Nigel, 1,920 ozs.; total, 10,064 ozs.

The sundry revenue included in the above total declared profit is as under:—Simmer and Jack, £1,500; Robinson Deep, £146; Knights Deep, £88; Simmer Deep, £210; Jupiter, £791; Sub-Nigel, £270; total, £3,005.

### MINING EXAMINATIONS.

Study for Certificates as Mine Captains, Mine Managers, Surveyors, Mechanical and Electrical Engineers, and Engine Drivers. Private Tuition and Correspondence Lessons, where personal tuition is impracticable. Practical Mathematics and Electrotechnics. E. J. MOYNIHAN, Consulting Engineer. Cathbert's Buildings, Corner of Eloff and Pritchard Streets. Johannesburg, P.O. Box 2061.

## THE WEEK IN THE SHAREMARKET.

Steady and Quiet—Far East Favourites in Demand—Effect of Higher Bank Rate.

BUSINESS has again been restricted during the past week and now that the liquidations have been effected, there is no great desire to buy, principally because there is nothing particularly cheap outside of the rubbish category, and at the same time there is no wish to sell. Outstanding features have been few. New Modderfonteins at £17 ex dividend provided the first; Brakpans at 80s. were the second; while Government Areas at 38s. 6d. contributed the third. The latter is practically the top price this stock has yet reached. The same is the case with Modders; while it is certainly a long while ago since Brakpans touched their present figure. A glance down the list presents little else of interest. African Farms and their sleeping partner, Leeuwpoots, continue hopelessly dull and weak. Aurora Wests have been strong in the buying price, but no sales were booked. If the profit of £5,000 per month continues, the debt of the company should be practically liquidated within twelve months, when the return on the small capital will prove quite satisfactory. City Deeps were unchanged; Cassel Coals and Mines Selection somewhat harder; City and Suburban and Main Reefs as before; Consolidated Langlaagte have eased off; likewise Geduld Props.; Bantjes and Knight Centrals are in better demand, and hope is again indulged of a further recovery. Modder B's and Modder Deeps are still running level, with a triling advance since last report. Kleinfonteins seem to be the sport of varied reports, rising and falling about a shilling a time, without apparent reason. Cements do not seem to be quite so much fancied, while Randfonteins continue out of the running. This still present a truly depressing appearance. Springs have come back a trifle from their rally. Coal Trusts have been dull and generally easier; Van Ryn Deeps show little change either way. Village Deeps, of once high-priced and gilded fame, are fast falling to the Randfontein level; while another once greatly-desired and ornamental security, Ferreira Deeps, to wit, now barely commands the price of Kleinfonteins. Knights and Wit, Deeps are about the same. Witbank Collieries, in which there are no sellers when there are buyers and no buyers when there are sellers, made another brief appearance and after the disposal of a couple of hundred shares, stuck well below the level of the previous buying price. The small goods with their penny difference, to which jobbers cling for their very lives, call for no comment. Daggafonteins came in for rather more enquiry in regard to the old shares, the new stock being entirely passed over. The Henderson lot are the medium of minor gumbling at, roughly speaking, about half their former prices. The Areakop venture has re-appeared, and is in process of being nursed upwards. On Friday morning the news that the Bank rate had been raised to 6 per cent. had an adverse effect on prices, which receded practically all along the line, with the exception of Brakpans.

	Fri. 7th.	Sat. 8th.	Mon. 10th.	Tues. 11th.	Wed. 12th.	Thurs. 13th.
African Farms...	8 9*	8 9	—	8 6*	8 6*	8 6*
Apex Mines...	5 6*	5 6*	5 6*	5 6*	5 6*	5 9*
Aurora Wests...	—	11 9*	—	12 3*	12 3*	12 3*
Bantjes Cons...	12 3	12 6	12 6	12 6*	12 3*	12 6*
Brakpan Mines...	75 6*	75 6*	—	—	76 6*	78 6*
Brick and Potteries	—	5 0*	5 0	5 0*	—	—
Bushveld Tins...	0 7*	0 7*	0 7*	0 7*	0 7*	0 8*
Cassel Coals...	—	—	20 0*	20 0*	20 0*	20 9*
Gunderella Cons...	5 9*	5 9*	5 9*	5 9*	5 9*	5 9*
City and Suburbans	30 6*	30 6	—	30 0*	30 0*	—
City Deeps...	75 0*	75 6*	75 0*	75 0*	75 0*	75 0*
Cloverfield Mines...	—	8 1	7 10*	7 11*	8 0*	8 0*
Concrete Construc.	1 0†	—	4 0†	—	—	—
Con. Investments...	—	11 0*	11 0*	11 0*	11 0*	11 0*
Con. Langlaagtes...	29 3	29 6	29 6	—	29 6*	29 0†
Con. Main Reefs...	18 0	18 0*	18 3†	17 9*	18 1†	18 0*
Con. Mines Select...	16 9*	17 3	16 9*	—	17 0*	17 9*
Crown Diamonds...	2 0	2 0*	2 0*	2 0*	2 6†	—
Durban Road. Deeps	11 0†	11 0†	11 0†	11 0†	—	—
E.R. Centrals...	8 0*	8 0*	8 0*	8 0*	8 0*	8 0*
E.R. Coals...	3 5*	3 7	3 6	3 6*	3 6*	3 6*
E.R. Deeps...	1 3*	1 3*	1 3*	1 5	1 3*	1 4

\* Buyers. † Sellers. a Ex dividend. b Odd lots.

	Fri. 7th.	Sat. 8th.	Mon. 10th.	Tues. 11th.	Wed. 12th.	Thurs. 13th.
E.R. Props...	14 0*	13 0*	14 0†	12 6*	12 0*	12 0*
E.R. Debs...	£72*	£72*	£72*	£72*	£72*	£72*
Eastern Golds...	1 8	1 7*	1 6*	1 7*	1 7*	1 6*
Ferreira Deeps...	29 0†	—	29 0†	29 0†	—	—
Frank Smith Dias...	2 0*	2 0*	2 1	2 0*	2 0	2 0
Geduld Props...	41 0*	42 6	42 6	42 0*	41 6*	41 6*
Glynn's Lyden...	—	—	15 6*	16 3*	—	—
Govt. Areas...	37 10†	37 9*	38 0a	38 0	38 0	38 6
Jupiters...	7 0a	7 0	6 6*	7 0	7 0*	7 3
Klerksdorp Props...	2 1*	2 0b	2 1*	2 1*	2 2	2 2*
Knight Centrals...	11 6	12 7	12 7	13 2	12 0*	12 6
Lace Props...	5 2*	5 3*	5 5*	5 6	5 8	—
Lyden. Farms...	6 9*	—	6 9*	6 9*	7 0	7 0*
Main Reef Wests...	6 6*	6 6*	6 6*	6 5*	6 5*	6 9*
M.R. West Debs...	—	£65*	—	—	£64	—
Middelvie Est...	1 1*	1 1*	1 1*	1 1*	1 1*	1 1*
Modder B's...	129 0*	129 0*	128 0*	128 0*	128 0*	128 0*
Modder Deeps...	129 0*	128 6*	128 6*	128 0*	128 6	128 6*
Leeuwpoot Tins...	14 0†	14 0*	13 6*	14 0*	—	13 6*
Natal Nav. Colls...	16 0*	—	17 6†	—	16 0*	17 0*
New Boksburgs...	1 6*	1 7*	1 6*	1 6*	1 6*	1 6*
New Eland Dias...	18 0	18 0†	18 0†	—	—	—
New Era Cons...	8 3*	—	8 6†	—	8 0*	8 0*
New Geduld Deeps...	5 0*	—	5 0	5 0*	5 0*	5 0*
New Kleinfonteins...	26 0	25 9	25 9	26 0	27 0	27 0
New Modders...	£162*	332 6*	331 3*	—	340 0	—
New Unifeds...	—	9 0*	9 3*	—	9 9*	—
Nigels...	5 0*	—	5 0*	—	5 0*	5 0*
Premier Diamonds	127 6*	127 6*	—	—	—	—
Premier Preferreds	—	—	132 6*	—	142 6*	—
Pretoria Cements...	70 6	69 0*	69 0*	69 0	—	68 0*
Princess Estates...	1 9*	1 9*	1 9*	1 9*	1 9*	—
Rand Collieries...	3 6†	3 6†	3 6†	3 6†	3 6†	3 6†
Rand Klips...	7 9	7 9*	7 7	7 10	7 8	7 9*
Rand Mines...	68 0†	—	68 0†	—	—	—
Rand Nucleus...	1 10*	1 10*	1 10	1 10*	1 9*	1 9
Randfontein Deeps	4 0†	4 0†	4 0†	—	3 6*	—
Randfontein Estates	11 0†	12 6	12 0*	12 0*	12 0*	12 0*
Rooibergs...	—	—	12 0†	11 0†	—	11 0*
Rood. Uniteds...	7 10*	—	8 0*	8 3*	8 6*	8 3*
Ryan Nigels...	2 6*	2 6*	2 6*	—	2 6*	2 6*
Shelba...	—	2 6†	1 9*	—	1 6*	1 6*
Simmer Deeps...	1 10*	1 9*	1 9*	1 9*	1 9*	1 10*
S.A. Lands...	4 2*	4 4	4 5	4 3*	4 2*	4 2*
Springs Mines...	53 9*	54 6	53 9	53 0	—	53 6
Sub-Nigels...	16 0*	—	16 0	16 0*	16 0*	16 6
Swaziland Tins...	—	—	24 0*	25 0*	—	—
Trans. Coal Trusts	67 0†	64 0*	—	66 0†	65 0†	64 6*
Transvaal Lands...	—	15 0†	—	15 3†	—	—
Trans. G.M. Est...	—	25 9	—	—	—	26 6†
Van Ryn Deeps...	—	65 6*	65 9*	65 0a	—	67 0
Village Main Reefs...	—	17 6†	—	17 6	12 0*	12 6*
Vogel. Con. Deeps...	—	1 0*	—	—	—	0 9*
Welgedachts...	22 6†	—	21 0†	21 0†	20 0†	20 0†
W.R. Estates...	—	1 0*	1 0*	1 0*	1 0*	—
Witbank Colls...	—	39 0*	39 0	39 0	39 0†	—
Witwatersrands...	—	—	—	—	51 0*	51 0*
Wit. Deeps...	22 9*	23 0*	23 0*	23 6*	23 0*	23 6*
Wolhuters...	9 10	10 0	9 10	10 0*	10 2*	10 0*
Zaaiplaat Tins...	8 3*	8 3	—	7 6	7 10	8 3*

## ANSWERS TO CORRESPONDENTS.

All inquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to inquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

"Caught."—However much we may sympathise with you, your letter is much too libellous to print.

"S.J.H."—Enquiries being made. Will reply next week.

"Shareholder."—Libellous. Another letter on the subject appears in this issue.

"J.S." (Capetown).—All six are worth holding on to—the Modder group being a particularly good selection. The two last are bound to improve with time. The diamond shares should also benefit from the better market for the product.

P. W. Caldwell (P.E.).—Write to W. E. Bleloch, Transvaal Bank Buildings, Johannesburg.

"D.P." (Durban).—(1) No. (2) Hold. (3) Yes.

"Digger."—All your questions are answered in the special article by Dr. P. A. Wagner, printed in this issue.

## THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

**Business in the Doldrums, though Better War News—The New Shipping Freights—Galvanised Iron Easier from Oversea—Linseed Oil Down through Oversea Rates and Keen Cutting in Johannesburg.**

TRADE for July so far has been disappointing, as a betterment was expected for this half-year. However, there have been several decent buying days, particularly in the excellent demand for wire ropes, as two groups are pronouncedly buying, and others are doing so quietly. To an onlooker, the reason for the lack of anything like active buying is not far to seek, as the mining people are, of a truth, the best informed as to the state of the metal markets, and as there has been a decided fall in several lines, it is not likely that whilst this continues they will further pile up stocks. For example, copper was £123 per ton about a month ago, and Thursday's cables quote only £93 on the London Metal Exchange, thus showing a drop of £30, which represents about a £1 per ton per day. Again, the private cables indicate that the British Government, whilst pressing the munition workers and encouraging the coal miners to give good outputs, is content with the present large number of munition factories. In fact a halt has been called, and factories generally are having a free hand with their ordinary work to keep up exports, with a view to paying for the British imports and keeping trade together. Another reason for no outstanding buying here is obviously the favourable war news, so much has this been recognised that many members have gone to Durban and other holiday resorts for a short spell.

**Shipping Freights.**—In a circular issued by the Johannesburg Chamber of Commerce, it is stated that steamers advertised to close for cargo at the first port of loading in the United Kingdom on and after the 10th July, the rate of freight to Capetown and Algoa Bay on all goods will be 80s. per ton, weight or measurement, at ship's option, with certain exceptions.

**Mining Material 60s. per Ton.**—The exceptions are many and practically include all mining material. Here are some: Anvils, asphalt, slates and tiles, axles and axle-boxes, bolts and nuts, bricks, clay, fencing standards, iron bars, hurdles, etc., firebars, flintstones, galvanised iron, grindstones, gypsum, iron and steel bars, tees, etc.; but not drill or tool steel, nails, pig-iron, iron and steel plates, rails and accessories, rivets, rods, screws, sleepers, structural material, excluding lattice girders, tankwork, tyres, washers, castiron pole bases, sashweights, shoes and dies, stone blocks for tube mills, slates, soap, sulphur, small tip-waggons, barbed wire and other wire in coils or bundles.

All at 60s. per ton weight, Capetown basis.

**Other Rates from 40s. to 120s. per Ton.**—Safety cartridges, fog signals, iron Kaffir pots and camp ovens, 120s. Empty casks or drums and Portland cement, 40s. Salt coarse, in bags, 45s. Deals, boards, battens and boxboards, lime, common, in tanks, manures, match boxes, wooden, matchwood and splints, 50s. Castiron pipes, 6in., 60s.; 16in., 70s.; 24in., 80s.; 36in., 100s. Castiron, hot water pipes and earthenware pipes, 80s. Wrought-iron and wrought steel tubes, 6in., 60s.; 12in., 80s.; water tube-boilers, not over 2 tons, 80s. to all ports. Boilers, other than water tube, railway locos, and traction engines, not over 3 tons, 50s., with the existing differential rates to all other ports.

No change has been made in the additional rates charged for heavy lifts and long lengths, also in the rates for goods charged on an *ad valorem* basis.

All the rates given are on the Capetown and Port Elizabeth basis. The rates to Mossel Bay, East London and Natal are 5s. per ton extra; Delagoa Bay 10s., and 15s. Beira, per ton extra.

There is a postscript, stating that the information contained in the circular in question will be found generally correct, but a few details may require attention.

**Timber, Bricks and Galvanised Iron.**—The freight for timber from the Baltic has risen £1 per ton, making £4. This has not affected the local values, neither is it likely to at present, owing to fair stocks being in Johannesburg and throughout South Africa. The fact is with the falling off in the demand from the building trade, and the severe competition amongst merchants for the restricted business going, prices are being cut to the lowest margins of profit. Good stock bricks are 2s. 6d. per 1,000 dealer for delivery in town, because the transport firms require more, now that feed is so scarce for their oxen. The latest cable from Britain not only asked a client for orders, for galvanised iron, but a fraction less was quoted for an immediate answer, than was named two months ago.

**Oil, Paints, White Lead and Linseed Oil.**—A leading house in the oil and colour trade complains of bad business during the past six weeks. One reason assigned is that property owners have been so liberally subscribing to the Government loan of 5 per cent. and thus postponing repairs and additions, until another season. Linseed oil has had rather a big drop in London, evidently owing to some Russian oils coming through via the North Sea, with plenty to follow. Now as there are abundant stocks in Johannesburg, and at the coast, large holders are pressing sales with the result that the price here of 27s. 6d. for 5-gallon drums is the same as that ruling at Durban. It was said by the agent supplying this information that 27s. 6d. only represents 1d. profit per drum on to-day's turnover. This is in consequence of the excessive competition, with a slackier all round demand, and importers are anxious not to be stuck with heavy stocks.

**Iron, Steel and Hardware Fittings.**—Partly as a result of the increased freight and partly because, according to the latest advices from the English Midlands there is still a great scarcity of steel, and practically all the output is required for Government purposes, there has been an advance of 2s. 6d. per 100lbs. on all sizes of steel plates, the details of which are embodied in our standard list of prices. Hexagon bolts also have advanced about 1d. per lb. for small sizes and 5s. per 100lbs. for the larger assortment. Obviously, it is likely that when the full force of the new freight rates come into play, when the arrivals, which leave Britain on and after July 10, reach South Africa, all values will be revised, unless the unforeseen happens.

**Trade Generally in the Doldrums.**—In an interview with a reliable broker it was ascertained that there has not been so much complaining amongst merchants for many a day. It is difficult to account for the lull; however, he ventured a few explanations. Perhaps the chief was the upsetting, as well as the uncertainty of the freight question; the more favourable war news; the stocks held by the mines, as well as an accumulation during the past few months of merchants stocks, in many cases rather unexpectedly. And what is more he concluded the extra supervision for economy's sake in the consumption of stores on the mines.

### REVISED PRICE LIST.

Approximate war prices, subject to quick change.—Mining and building hardware: Iron, imported, round up to 1 in., 30s.; 1½ in. to 2 in., 13s. 6d.; 2½ in. to 6 in.,

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25s. per 100 lbs. Do., aquare, up to 1 in., 27s. 6d.;  $1\frac{1}{2}$  in. to  $2\frac{1}{4}$  in., 13s. 6d.;  $2\frac{1}{2}$  in. to 5 in., 25s. Flats, 3-16 in., 37s. 6d.; all from  $\frac{1}{4}$  in. up, 25s. Angles,  $\frac{1}{4}$  in. to 3-16 in., 30s.;  $\frac{1}{2}$  in., 27s. 6d.; 5-16 in. to  $\frac{3}{4}$  in., 25s., excepting 5 x 4 x  $\frac{1}{2}$  in.; mild steel bar, 3 $\frac{1}{2}$  lb.; drill, 6 $\frac{1}{2}$  lb.; steel plates, 10ft. by 4ft. by 1-16th in., 35s.;  $\frac{1}{2}$  in., by 3-16in., 32s. 6d.;  $\frac{1}{4}$  in. to 5-16th in., 31s.;  $\frac{1}{2}$  in., up to 30s.; 10ft. by 5ft. by 1-16in., 36s. 6d.;  $\frac{1}{4}$  in. and 3-16in., 34s.;  $\frac{1}{2}$  in. to 5-16in., 32s. 6d.;  $\frac{3}{4}$  in., up to 31s. 6d.; intermediate sizes up to 12ft. by 6ft. by 1-16in., 37s.;  $\frac{1}{2}$  in. and 3-16in., 34s. 6d.;  $\frac{1}{4}$  in. and 5-16in., 33s.;  $\frac{3}{4}$  in. and up, 32s., all at per 100lbs.; hexagon bolts,  $\frac{1}{2}$  in. to 3in., 9d. per lb.; over 3in., 8d. per lb.;  $\frac{1}{2}$  in. up to  $2\frac{1}{2}$  in., 55s.;  $2\frac{1}{2}$  in. to 6in., 52s. 6d.;  $6\frac{1}{2}$  in. and over, 50s.;  $\frac{1}{2}$  in. up to  $2\frac{1}{2}$  in., 50s.;  $2\frac{1}{2}$  in. to 6in., 17s. 6d.;  $6\frac{1}{2}$  in. and up, 42s. 6d.;  $\frac{1}{2}$  in.,  $\frac{1}{4}$  in., and 1in., up to  $2\frac{1}{2}$  in., 45s.;  $2\frac{1}{2}$  in. to 6in., 42s. 6d.; 6in. and up, 40s. 6d. 100lbs. Nuts,  $\frac{1}{2}$  in., 9d. lb.;  $\frac{1}{4}$  in., 50s.;  $\frac{3}{4}$  in. to  $1\frac{1}{2}$  in., 47s. 6d.;  $1\frac{1}{2}$  in. to  $1\frac{3}{4}$  in., 52s. 6d. per 100 lbs.; 2 in., 7 $\frac{1}{2}$  d. per lb.; washers,  $\frac{1}{2}$  in. and under, 37s. 6d., and above that size, 32s. 6d. per 100lb.; shoes and dies, 32s. 6d. to 35s. per 100lb.; rails, £20 per ton; picks, 4 lbs., 27s. per doz.; shovels, 32s. 6d. to 50s. per doz.; hammers, drill, 7 $\frac{1}{2}$  d. to 9d. lb.; hammer handles (best American), 14 in., 3s. 6d., 24 in., 5s. 6d., 30 in., 7s. 6d., 36 in., 10s. 6d. per doz.; metal, anti friction, 1s. per lb.; galvanised iron, 24 gauge, 6 ft. to 10 ft., 10d., 11 ft. 10 $\frac{1}{2}$ d., 12 ft. 10 $\frac{1}{2}$ d.; 26-gauge, 6 ft. to 10 ft., all lengths, 8 $\frac{1}{2}$  d. to 9 $\frac{1}{2}$  d. per ft. all-round; flat galv., 18 to 24 gauge, 32s. 6d.; 26 gauge, 34s. 6d. 100 lbs.; floor brads, 30s.; ceiling, 30s.; wire nails, 29s. to 32s. 6d. per 100 lbs.; solder, 50 per cent., 1s. 2d. per lb.; locks, rim, 45s.; mortice, 60s. doz.; barbed wire, 22s. 6d. to 25s. 100 lbs. coil.

Timber: Deals, Baltic, 9 x 3, up to 16 ft., 1s.; over, 1s. 1d. to 1s. 3d. (Oregon, 11 $\frac{1}{2}$ d.); flooring,  $4\frac{1}{2}$  x  $\frac{1}{2}$  and 6 x  $\frac{1}{2}$ , 6 $\frac{1}{2}$  d. to 6 $\frac{1}{2}$  d. per sq. foot; do.,  $4\frac{1}{2}$  x  $1\frac{1}{2}$ , 7d.; and 6 x  $1\frac{1}{2}$ , 7d.; Oregon edge grain, 6d. to 7 $\frac{1}{2}$  d.; ceilings, 6 x  $\frac{1}{2}$ , 3 $\frac{1}{2}$  d. to 3 $\frac{3}{4}$  d. per sq. ft.; Oregon, 4 x  $\frac{1}{2}$ , 4 $\frac{1}{2}$  d.; pitch pine, 7s. 6d. to 7s. 9d. per cub. ft.; Oregon, 5 $\frac{1}{2}$  x 6d. per cub. ft.; clear pine,  $\frac{1}{2}$  in. x 12in., 7 $\frac{1}{2}$  d. per foot; 1in. x 12in., 8 $\frac{1}{2}$  d.; teak, small planks, 15s. per cub. ft.; do., large, 16s.; jarrah, 8s. 6d. per cub. foot; poplar, 1in. x 12in., 9 $\frac{1}{2}$  d.; scantling, 9 x 3, 1s. to 1s. 3d. per foot.

Bricks, cement, lime, etc.: Cement, nominal, 34s. 6d. per cask; Pretoria Portland, 9s. 3d. bag; 8s. 3d., truck loads; lime, white, 7s. 9d.; truck loads, 6s. 9d., slaked; do., 5s.; blue, 3s. 6d.; plaster lime, 4s.; bricks at kiln, stock, 36s. to 42s.; wire cuts, 40s. to 50s. pressed, 65s. per 1,000, road transport getting scarce; salt and white glazed bricks, £27 10s per 1,000; tiles, roofing, £17 $\frac{1}{2}$  square; glazed tiles, 10s. 6d. to 17s. 6d. yard; paving cement tiles, 8s. 6d. yard laid; terra cotta tiles, £15 per 1,000; reinforced concrete columns, 6 ft. plain, 22s. 6d., fluted, 24s.; fireclay bricks, £9 $\frac{1}{2}$ , good average, per 1,000; clay chimney pots, 80s. per doz.; fireclay, 37s. 6d. ton on rail.

Oils, paints, lead, oxides, glass: Linseed, raw, 27s. 6d.; boiled, 27s. 6d. per 5-gall.; white lead, 70s. to 72s. 6d. 100 lbs; turpentine, 52s 2/4 galls.; 10/1, 57s.; coal tar, imported, 10s. to 12s. 6d. per 5 galls.; oxide in oil, 33s. 6d. to 37s. 6d. per 100 lbs.; dry oxide, 21s. to 22s. 6d.; S.A. crude oxide, 12s. 6d.; linseed oil putty, 4s. 6d. per 12 $\frac{1}{2}$  lbs.; bladders, 35s. casks of 100lbs.; grease A.F. axle, 23s. 6d. to 25s. per 100 lbs.; tallow, 1s. per lb.; White Rose paraffin, 16s. 3d. 2 5; Laurel do., 16s.; petrol, 26s. 6d. 2/4; motor oil, 6s. to 7s. 9d. per gallon; engine lubricating oils, 19s. to 32s. per case; cylinder, 20s. to 35s.; paints in tins, 10d. to 1s. per

lb., according to quantity, and if ordered to be mixed, 15 per cent. on pre-war rates. British plate-glass,  $\frac{1}{4}$  in., 3s. 6d.; do., mirror, 1s. 6d.; window, 16oz., 1s. to 1s. 3d. foot.

Chemicals: Mercury, £18 $\frac{1}{2}$  per 75 lb. bottle; bichromate potash, 2s. 6d. lb.; chlorate, 2s. 6d. lb.; permanganate, 4s. lb.; alum, 5d. lb.; carbolic acid, 7s. 6d. lb.; borax, 85s. 100lbs.; cyanide soda, 1s. 4d. lb.; hypo, 6d. lb.; acetate lead, 70s. 100lb.; litharge (assay), 75s. (commercial), 55s. 100lbs.; zinc sheets and blocks, 1s. 3d. lb.; plumbago crucibles, 5d. per number.

Electrical Goods: Lamps, high volts., British, Holland & American, 16s. to 21s. wholesale, and 21s. to 27s. dozen, retail; carbon lamps, 7s. 6d. per dozen; pure rubber flex, 6d. to 8d. per yard; 3 20 coils of wire, 27s. 6d.; do., 3' 22, 23s. 6d.; tubing, 12s. to 13s. 100ft.; keyholders, 2s. 6d. ea.; round blocks, 3 $\frac{1}{2}$  in., 4s. dozen; lump holder cord grips, 15s. doz.; switches, 5 amp., 13s. to 14s. doz.; British glass shades, 24s. to 36s. doz.; Bohemian shades finished; porcelain shackles, 14s. 6d. doz.; do., bobbins, 16s. 6d. to 18s. 100; cleats, 18s. per 100; P.O. insulators, 18s.; motors, 3 h.p., about £28 to £35, new.

### Rhodesia Broken Hill.

From June, 1915, to May, 1916, the small smelter produced 1,000 tons of lead. Orders have been placed for the construction of two blast furnaces and other plant. It is hoped that the whole plant will be delivered by the end of August. The first unit is expected to be running towards the end of this year and the second unit about a month or two latter. The total capacity of the new furnaces should be not less than 900 tons of lead per month. Financial arrangements are in progress whereby the cost of this plant and the company's present indebtedness will be discharged.

### Tati.

The report of the Tati Company, Ltd., for the year ended February 29 last states that the profit is £1,731, as compared with £775 a year ago, making, with the balance brought forward, a total of £2,506. The directors have decided to write off the preliminary expenses, £1,695, leaving £811 to be carried forward. The whole of the properties acquired from the old company have now been transferred into the name of the Tati Company, Ltd.

## OIL WELL DRILLERS.

The Sakalava Madagascar Proprietary Oil Fields, Limited, wish to obtain the services of a thoroughly competent driller and assistant driller to proceed to Madagascar.

Experienced oil well drillers can be obtained from America, but before concluding agreements the Company desire to ascertain if there are any drillers resident in this country who are open for engagement.

It will be quite useless for anyone to apply who has not had a thorough experience in DRILLING FOR PETROLEUM, and who cannot produce evidence of being temperate, energetic and trustworthy.

The Company is also prepared to receive and consider applications for drilling by contract, either by those willing to supply their own plant, or to use plant supplied by the Company.

Applications to be addressed—

SECRETARY,

Sakalava Madagascar Proprietary Oil Fields, Limited,

71, Standard Buildings, Johannesburg.

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Expert Winders of Motors, Dynamos and Coils of every description. Makers of all classes of spare parts. Turning. Electrical Plants installed. Maintenance Contracts entered into, covering cost of all breakdowns, at low rates.

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## New Companies.

### COMPANY REGISTRATIONS.

Collieries Engineering Company, Ltd., 8, Standard Bank Chambers, Commissioner Street, Johannesburg; capital, £15,000 (private company).

The South African Co-operative Egg Circle, Ltd., Shop No. 9, Aegis Buildings, 99, Fox Street, Johannesburg; capital, £2,500.

Kapodra Estate, Ltd., Bethel, P.O. Bodenstein, District Lichtenburg; capital, £500 (private company).

Andresen and Co., Ltd., 275, Pretorius Street, Pretoria; capital, £1,675 (private company).

Pelucine Chemical Industries, Ltd., 156, Anderson Street, Johannesburg; capital, £1,250 (private company).

Kameel Citrus, Ltd., Estate Buildings, 106, Fox Street, Johannesburg; capital, £8,600 (private company).

Laher and Cassim, Ltd., 181, Market Street, Johannesburg; capital, £2,000 (private company).

Rand Chemical Co., Ltd., 84, Albert Street, Johannesburg; capital, £5,000 (private company).

The Church of God and Saints of Christ, Marabastad, near Pretoria; capital, £100 (Section 21).

Tarajia Estates, Ltd., corner of Main and Collen Streets, Nylstroom; capital, £600 (private company).

Smith, Ltd., Church Street, Zeerust; capital, £300 (private company).

Wadee Estate Company, corner of Burger and Vry Streets, Standerton; capital, £500 (unlimited).

A. Schollum, Ltd., 12, Jeppe Arcade, Commissioner Street, Johannesburg; capital, £100 (private company).

W. C. A. Shepherd, Ltd., Barsdorf Buildings, Marshall Street, Johannesburg; capital, £5,000 (private company).

Standard Milling Co., Ltd., Carl Street, Pretoria West; capital, £1,500 (private company).

Sutherland, Ltd., 83, Commissioner Street, South African Mutual Buildings, Johannesburg; capital, £1,500 (private company).

Essapore, Ltd., 922, Second Avenue, Asiatic Bazaar, Germiston; capital, £1,000 (private company).

The Hex Trading Co., Ltd., 100, New Stock Exchange Buildings, Holland Street, Johannesburg; capital, £1,000 (private company).

The Colaba Trading Company, Ltd., corner of Station and Edward Streets, Roodepoort; capital, £2,000 (private company).

Doornfontein Trust, Ltd., 20, Davis Street, Doornfontein, Johannesburg; capital, £400 (private company).

Reuter and Lalin, Ltd., 15, Ginsberg Chambers, 80, Main Street, Johannesburg; capital, £1,500 (private company).

### FOREIGN COMPANIES.

Aerators (South Africa), Ltd., care of G. H. Wilson, corner of Simmonds and Bree Streets, Johannesburg; capital, £2,000.

S.A.I.F. Co-operative Development Co., Ltd., care of J. Glen Davidson, 3, Old Trades Hall Buildings, Commissioner Street, Johannesburg; capital, £10,000.

### ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

Compound Diamond Syndicate, Ltd., Johannesburg.

### PROSPECTUSES.

Transvaal Fertiliser Co., Ltd., Pretoria.

The Standard Motor Works, Ltd., Pretoria.

### SPECIAL AND EXTRAORDINARY RESOLUTIONS.

The United Mineral Water Factories, Pretoria, Ltd., Pretoria; removal of director.

Prince's Café, Ltd., Johannesburg; liquidation.

Pelucine Chemical Industries, Ltd., Johannesburg; liquidation.

Provident Estates Corporation, Ltd., Johannesburg; liquidation.

Reid and Chicken, Ltd., Johannesburg; liquidation.

General Estates, Ltd., Johannesburg; reduction of capital.

G. Roudi, Ltd., Johannesburg; liquidation.

The Bourke Trust and Estate Company, Ltd., Pretoria; alteration of articles.

Basson and Timberlake, Ltd., Johannesburg; alteration of articles.

B. Korr and Co., Ltd., Johannesburg; confirmation of agreement.

The Mac Mac Estates, Ltd., Pilgrim's Rest; bond.

Farmers' Agency (Co-operative), Ltd., Johannesburg; liquidation.

Paardekraal Estates, Ltd., Johannesburg; destruction of books.

### NOTICES OF INCREASE AND DECREASE OF CAPITAL.

Stavoren Tin Mining Co., Ltd., Pietersburg; increased from £16,000 to £20,000.

Northern Trust Company, Ltd., Johannesburg; increased from £2,000 to £3,000.

Rand Safe Deposit Company, Ltd., Johannesburg; reduced from £12,000 to £1,100.

Springs Mines, Ltd., Johannesburg; increased from £795,000 to £1,000,000.

Fresh Meat Supply Co., Ltd., Johannesburg; reduced from £15,000 to £7,000.

Gibson's, Ltd., Johannesburg; increased from £6,000 to £10,500.

Platoppies Syndicate, Ltd., Johannesburg; increased from £1,500 to £2,000.

Richmond Hardwoods, Ltd., Johannesburg; increased from £1,500 to £2,500.

The following companies have been placed in voluntary liquidation:—

Prince's Café, Ltd., Johannesburg; capital, £7,000.

Pelucine Chemical Industries, Ltd., Johannesburg; capital, £2,700.

Provident Estates Corporation, Ltd., Johannesburg; capital, £750.

Reid and Chicken, Ltd., Johannesburg; capital, £7,500.

G. Roudi, Ltd., Johannesburg; capital, £10,000.

The Farmers' Agency (Co-operative), Ltd., Johannesburg; capital, £2,300.

### NOTICES OF CHANGE OF ADDRESS.

Provident Estates Corporation, Ltd. (in liquidation), 36, Standard Bank Chambers, Commissioner Street, Johannesburg.

Press Cuttings, Ltd., 16 and 17, Permanent Buildings, Harrison Street, Johannesburg.

H. W. Alkin, Ltd., Alkin House, 5, Loveday Street, Johannesburg.

Transvaal General Agency, Ltd., No. 10, Brayshaw's Buildings, corner of Fox and Holland Streets, Johannesburg.

B. Korr and Co., Ltd., 255, President Street, Germiston.

Ascot Pharmacy, Ltd., Derby Buildings, corner of Derby Road and Fuller Street, Bertrams, Johannesburg.

Sakalava Madagascar Proprietary Oil Fields, Ltd. (foreign), care of C. W. Herald, 221-2, Consolidated Buildings, corner of Fox and Harrison Streets, Johannesburg.

Folakara Oil Fields, Ltd. (foreign), care of C. W. Herald, 221-2, Consolidated Buildings, corner of Fox and Harrison Streets, Johannesburg.

Good Hope Salt Works, Ltd., 26, Steytler's Buildings, Loveday Street, Johannesburg.

Kempman, Ltd., 126, Market Street, Johannesburg.

Premier Pharmacy, Ltd., 14 and 15, Commercial Exchange Buildings, Main Street, Johannesburg.

Asmana and Co., Ltd., 45, Green's Buildings, Commissioner Street, Johannesburg.

Spiritualistic Church of South Africa, 4, Old Trades Hall, Small Street, Johannesburg.

## New Patents.

136. James Valentine Snodgrass.—Process for producing Epsom salts (magnesium sulphate).
137. Malcolm Stewart Beaton and Stewart Youngson.—Improvements in self-closing valves for tubular connections.
138. Marie Olive Cranston.—Improvements in and relating to the construction and erection of reinforced concrete mine props or posts and the like.
139. George Henry Medley.—Improvements in the treatment of slimes and in apparatus therefor.
140. Robert Macpherson and William Edwin Heys.—Improvements in the manufacture of detersive and emulsive agents.
141. Allen Crawford Howard and Louis Albert Wood.—Improvements in or relating to the concentration of ores.
142. John Flint, George Bolton and William Alexander McLaushlan.—An improved composition to be used as a substitute for air in the tyres of motor and other vehicles.
143. Benjamin Jenkins.—A device for atomising water and similar fluids.
144. Christiaan Cornelius van der Valk and Francois Marinus van Panthaleon, Baron van Eck.—Improvements in lock-nuts.
145. Woods-Gilbert Rail Planer Company, Ltd.—Improvements in machines for dressing rails.

## Real Estate Corporation.

The report of the Real Estate Corporation of South Africa, Ltd., for the year ended March 31 last states that the revenue was £25,574, as against £27,646 last year. Owing to damage caused by anti-German riots extra expenditure was incurred of £1,373 for repairs, and the increase in expenses, together with the increase in taxation, reduced the net profit to £9,057. The balance from last account was £18,403, and after writing off £1,250 against depreciation of buildings, the directors recommend a final dividend of 4 per cent., making 6 per cent. for the year, and leaving £17,211 to be carried to next account.

## WANTED.

Electrical Engineer for large Rand Gold Mining Company. Good salary to suitable man.—Apply: "Electric," P.O. Box 678, Johannesburg.

## ***SOUTH AFRICAN RAILWAYS & HARBOURS.***

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Excursion tickets at single fare for the return journey will be issued in local and in through bookings to stations on:---

South African Railways	} Minimum Fare 1/-
Rhodesia Railways (Vryburg-Mafeking section)	
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4th, 5th, 6th and 7th August.

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Johannesburg,  
July, 1916.

W. W. HOY,  
General Manager.

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P.O. Box 1905,  
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JOHANNESBURG.

THE  
South African  
**MINING JOURNAL**  
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VOL. XXV. PART II. No. 1294.] JOHANNESBURG, TRANSVAAL, SATURDAY, JULY 15, 1916.

[WEEKLY, PRICE 6d.

## ELECTRICITY THE MONEY SAVER



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Such a Locomotive will do the work of from 50 to 100 natives in tramping underground. Its cost for power will be **less than £5** per month.

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